Bill-to-Bill

Currency Management System

Operation and Service Manual

Part 1. Operation Manual

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GENERAL DESCRIPTION

The **Bill-to-Bill Currency Management System** is an automatic money-handling device that provides the following features:

1) Validating bills (any country, sizes as specified). Validated bills are distributed between three recycling cassettes and one lockable-removable drop cassette. A maximum of three denominations may be directed to the recycling cassettes, while the rest of the bill denominations will be directed to the drop cassette.

2) Dispensing bills. Bills housed in the recycling cassettes can be bundled and dispensed as change to a customer (up to twenty bills at a time).

3) Unloading bills. Bills from the recycling cassettes can be moved into the drop cassette.

The Bill-to-Bill can be programmed to operate in different modes. For example, bill denominations may be designated for each recycling cassette; choice of escrow settings may be specified, etc.

GENERAL SPECIFICATIONS

Acceptance:
Bills……lengthwise in 4 directions
Barcoded coupons……two ways, face up
Validation rate……96% or higher on first bill insertion
Width of bill, in mm……from 62 to 82
Maximum length of bill, in mm……172
Minimum length of bill, in mm……124

Barcoded Coupon Specifications:
Encoding standard……ANSI/AIM BC2-1995, Uniform Symbology Specification – Interleaved 2 of 5
Narrow bar width, in mm……0.5 to 0.6
Wide/Narrow bar ratio……3:1
Number of characters……6 to 18
PSC (Print Contrast Signal) value ……0.6 min

Bill storage:
Number of recycling cassettes……3
Number of drop cassettes……1
Recycling cassette capacity……80 to 110 bills depending on bill length
Drop cassette capacity (new bills)……1000 bills

Dispensing ability……bundles up to 20 bills at a time

Multi-escrow mode
Single dispensing……up to 20 bills
Several dispensing attempts……up to 80 - 110 bills depending on bill length

Processing time, in seconds:
Time of identification (from bill insertion to credit issue)……2.5
Time between two entered bills…… 3.5 to 4.5
Total time to accept one bill to recycling cassette…… 3.5 to 4.5
Total time to accept one bill to drop cassette…… 3.5 to 6
Total time to issue change of 1 bill……3
Total time to issue change of 20 bills …… 26

Dispensing speed……1.4 second per bill, max.

Firmware updates options:
Standard……CashCode Memory Stick
Network…… Download mode in CCNET protocol or in the service mode

External Interfaces:
Standard……Bi-directional EIA-232C (RS232)
Protocol…… CCNET

Power consumption for B2B with plastic Bezel
Operating voltage…… 24 V DC
Current, standby……0.6 A
Current, operating mode……2.4 A (4 A peak)

Power consumption for B2B with metal Bezel

Operating voltage…… 24 V DC
Current, standby, peak, unit at 0°C to +50°C, bezels at -30°C to +5°C .....2.2 A
Current, standby, bezels at +5°C to +60°C ……..0.6 A
Current, operating mode……2.4 A (4 A peak)

Dimensions (W x H x D)……..163 x 569 x 378 mm

Weight
B2B plastic bezel..…… 17.2 kg
B2B metal bezel..…… 18.2 kg
B2B loader……17.8 kg

Approvals:

Safety Standards
for Coin and Currency Changers and Actuators - Component……..UL 756
FCC Compliance
Radiated Emissions from Unintentional Radiators (digital devices)
FCC Part 15, Subpart B 15.109a Class B

CE Compliance……Information Technology Equipment

Electromagnetic Compatibility (EMC)
Conformity to the Following Standards:

CISPR 22:2003 +A1:2004 / EN 55022:2003 Class A - Class A Limits for RF disturbance characteristics of Information Technology Equipment

CISPR 24:1997 / EN 55024:1998 +A1:2001 & + A2:2003 Immunity Characteristics – Limits and Methods of Measurements

Vibrations, Drop and Shock resistance:

Vibrations (sinusoidal) IEC 60068-2-6 Fc: 1995

vibration acceleration amplitude…….. a= 12 m/sec^2
bandwidth……. F = 10...200 Hz
sweep rate…… one octave per minute

vibration acceleration amplitude …… a= 19,8 m/sec^2
bandwidth……. F = 10... 500 Hz
sweep rate…… one octave per minute

Endurance at random vibration wide band testing within F = 10. . .200 Hz at 12 m/s^2 mean-square acceleration amplitude and number of loading cycles n = 10 e-7
Control method:
Bill-to-Bill™ operation was continuously controlled by means of the bill loading and unloading. No malfunction or stoppages were registered in the Bill-to-Bill™ operation.

Mechanical Shocks

Shock endurance at shock testing
(Shock: **IEC 60068-2-27 Ea: 1987**; Bump: **IEC 60068-2-29 Eb: 1987**):

shock repetition frequency……..…….. F = 80 shock / min
acceleration amplitude ……..……30 m/s^2
duration ……..…….....T=10...12 msec
number of shocks…….....……2000
Control method:
Bill-to-Bill™ operation was continuously controlled by means of the bill loading and unloading. No malfunction or stoppages were registered in the Bill-to-Bill™ operation.

Free Fall IEC 60068-2-32 Ed: 1975

Test Conditions:
Bill to Bill Currency Management System tested as a whole unit.
Drop height ……..……..……..50 mm
Surface…….....……3 mm thick steel plate on wood bed at 20°C and 58% RH

The Bill-to-Bill™ survived the test free from any serious complications and preserved its full functionality.

Environment:
Operating environment…..…….....……..……Indoor or environmentally protected stationary applications
Operating Temperature for Bill-to-Bill unit…….....……..……..0°C to +50°C
Operating Temperature for metal bezels with
heating element (Bill-to-Bill unit to be
in the temperature range stated above)…….....……..-30°C to + 60°C
Storage Temperature…….....……..…-30°C to +60°C
Humidity (non-condensing)…….....……..……..30%-90%RH

Optional security features:

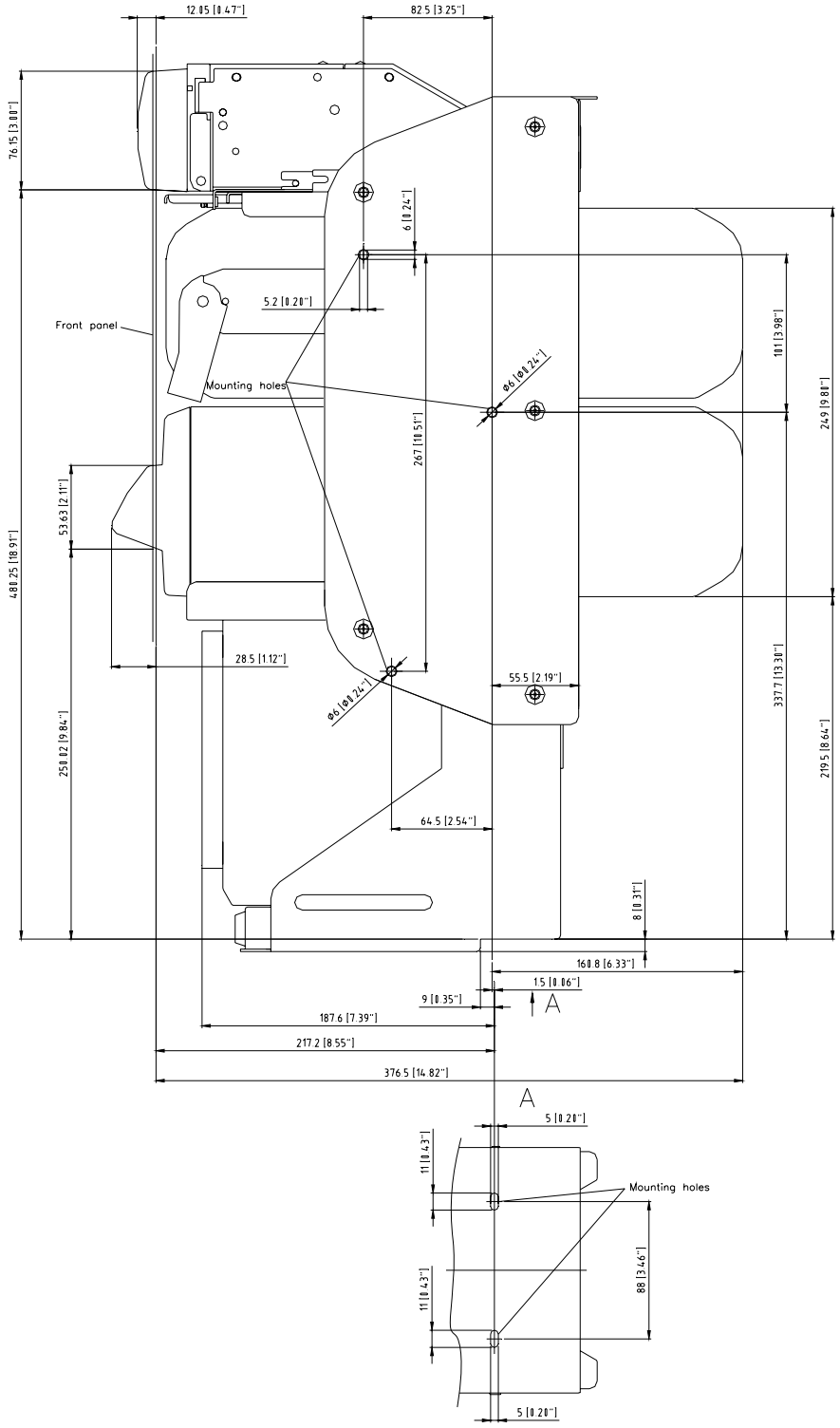
Drop cassette…….....……one or two ¾" tubular locks
Housing…….....……one ¾" tubular lock for drop cassette
Housing…….....……2 security switches to signal alarm when drop cassette unlocked or removed; chassis unlocked and removed
Chassis…….....……..one ¾" tubular lock for locking chassis, recycling cassettes and dispensing cassette inside housing

Optional features:

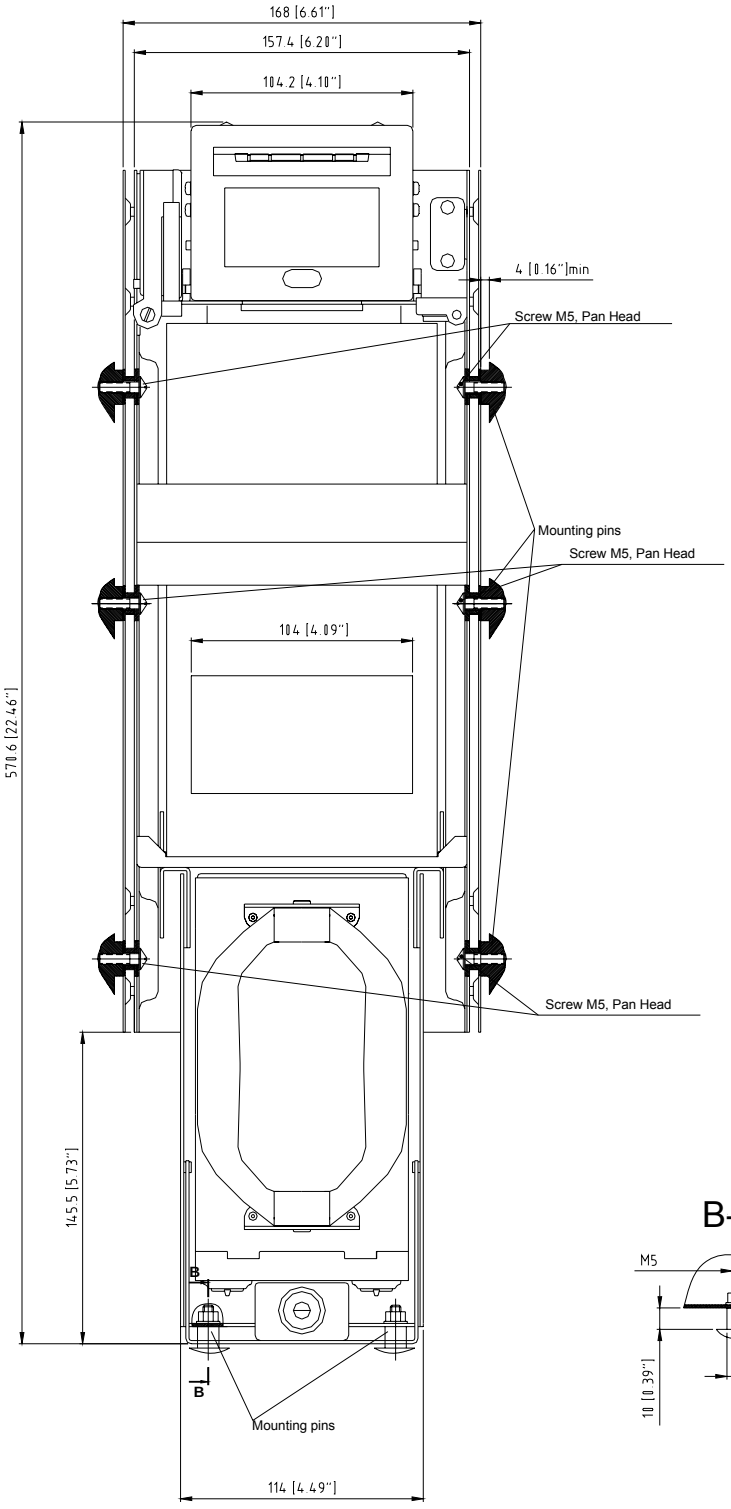
- Vandalism-proof metal bezel for validating head
- Vandalism-proof metal bezel with heating element for dispenser
- Drop cassette equipped with Cash Manager

OUTLINE DRAWINGS

Standard Bezels



Side view

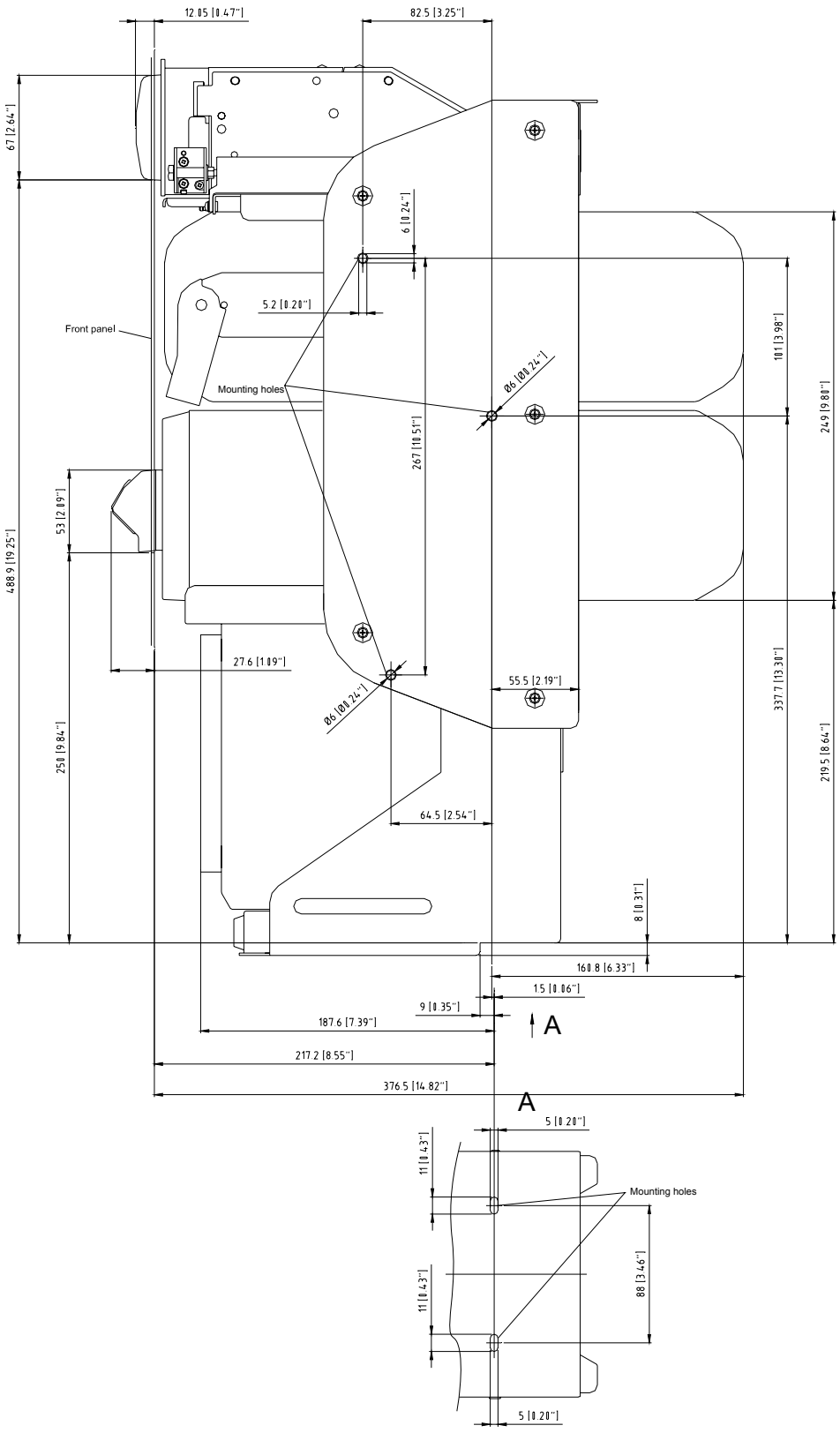


Front view

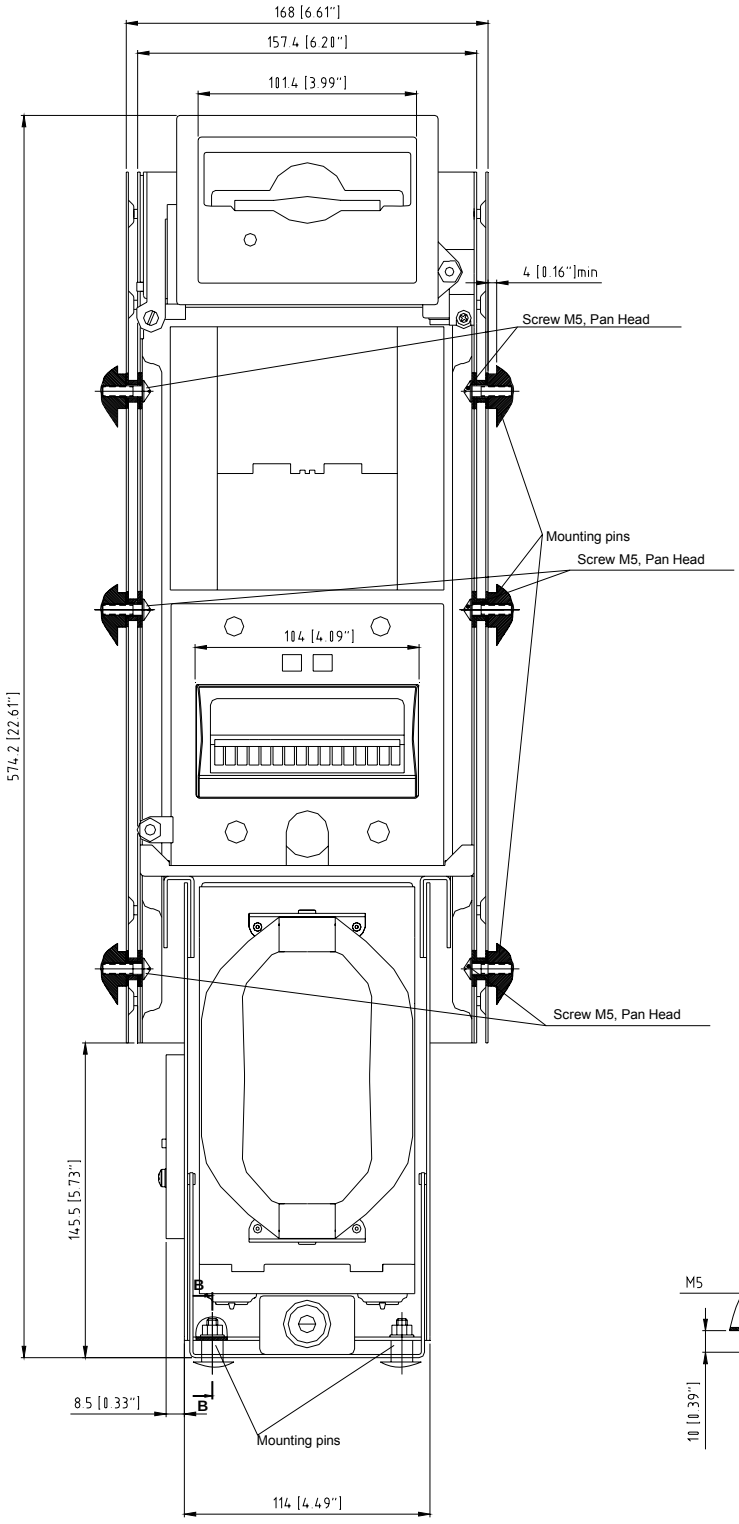
The recommended installation:

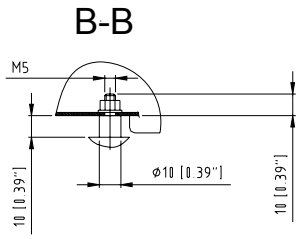
- Bottom must be supported by mounting pin – qty 2
- Side mounting by metal fasteners (M5 – Qty 3 each side) with your own version of bracket from left or right side

Metal Bezels



Side view



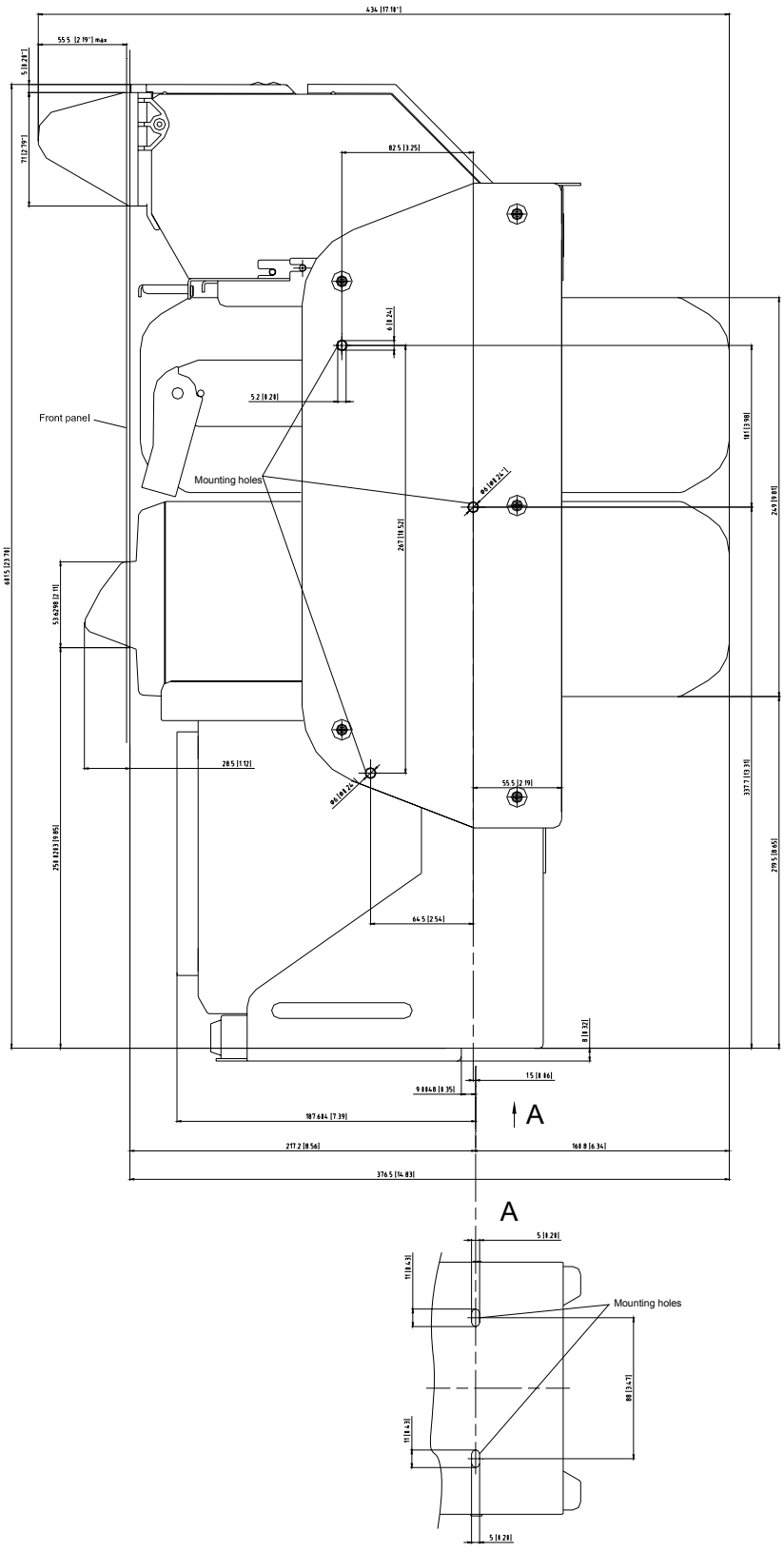


Front view

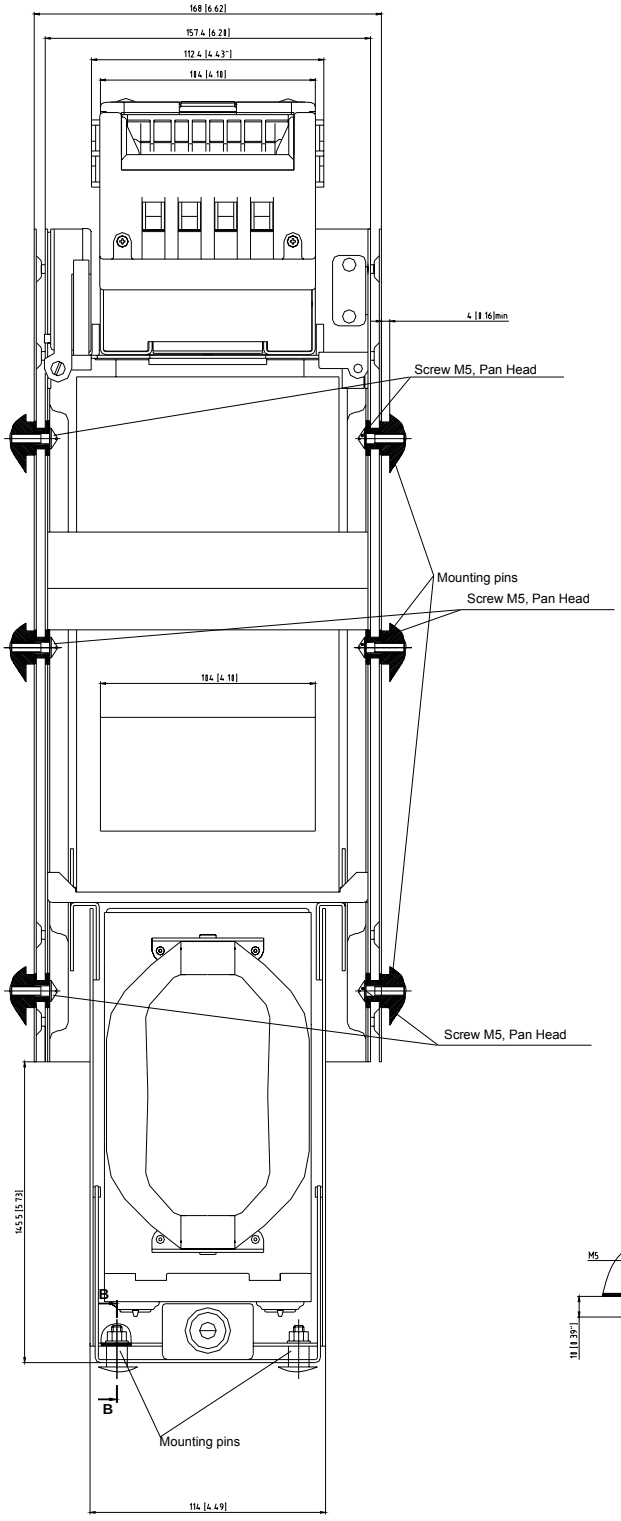
The recommended installation:

- Bottom must be supported by mounting pin – qty 2
- Side mounting by metal fasteners (M5 – Qty 3 each side) with your own version of bracket from left or right side

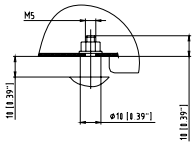
Loader



Side view



B-B



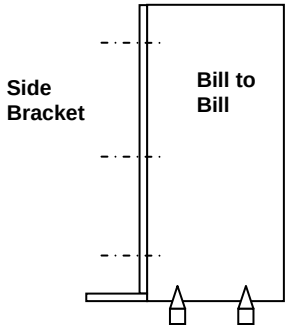
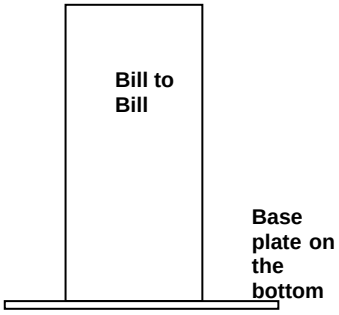
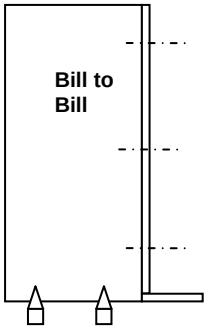
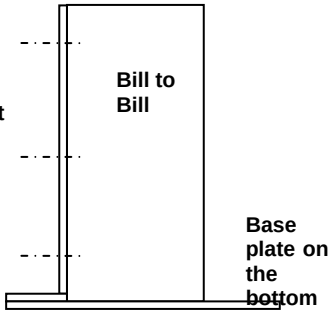
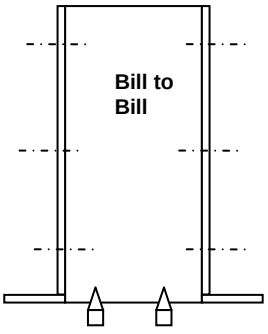
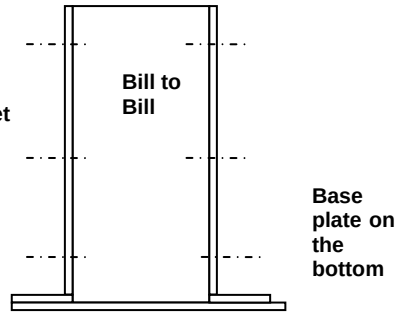
Front view

The recommended installation:

- Bottom must be supported by mounting pin – qty 2

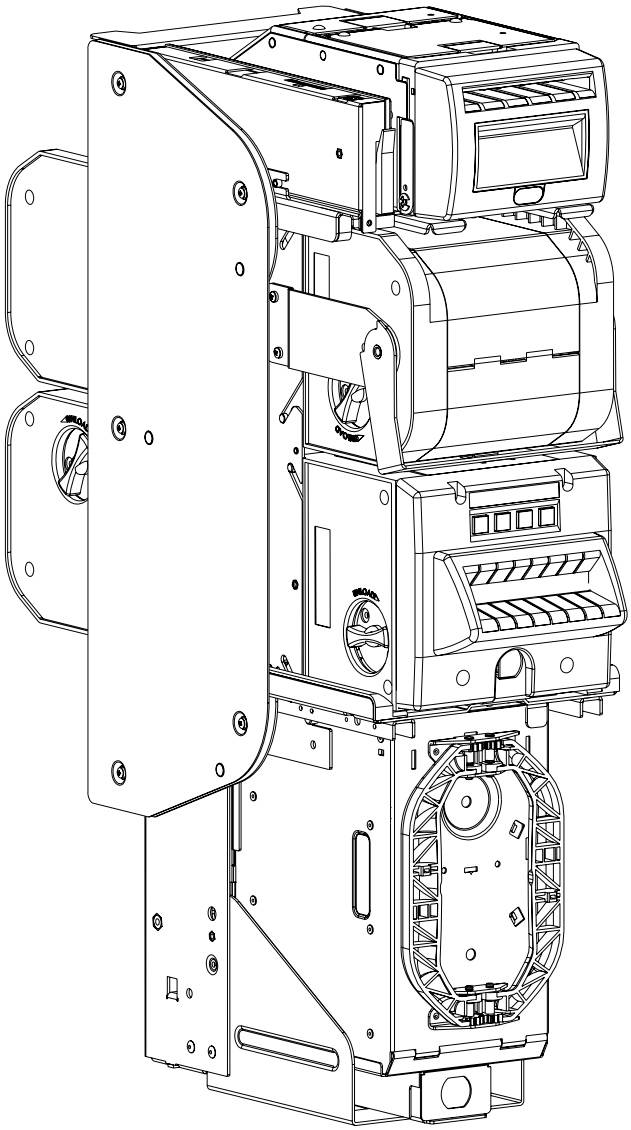
- Side mounting by metal fasteners (M5 – Qty 3 each side) with your own version of bracket from left or right side

Installation View

GOOD Installation	Poor Installation
 √ Side Mounting and Mounting Pin on the bottom	 ⊗ Flat base plate on the bottom. This is not recommended
 √ Side Mounting and Mounting Pin on the bottom	 ⊗ Side Mounting and flat base plate on the bottom. This is not recommended
 √ Side Mounting on Both Side and Mounting Pin on the bottom	 ⊗ Side Mounting and flat base plate on the bottom. This is not all recommended

Description of modules

The **Bill-to-Bill** was built on modularity principles, just like the CashCode FrontLoad bill validator product. The **Bill-to-Bill** consists of the following modules:



Validating Head – accepts and validates legitimacy of bill

Bezel – Six different bezels are available—however, bezels with a digital display are recommended (for Software update and diagnostics via a service keypad)

Sense-a-Click™ sensor pack – Four versionas are available depending on currency set

Power Interface Module - Only one variety may be used with the B2B

Drop Cassette - Secure Cashbox, it is referred to as a "cassette"

Memory Card - is universal for all CashCode products

Housing – 2 types

Chassis – 1 type

Recycling Module – Consists of a total of three recycling cassettes

Dispensing Cassette – 2 types

Path Switch – 1 type

Bill-to-Bill Power Interface Module – 1 type

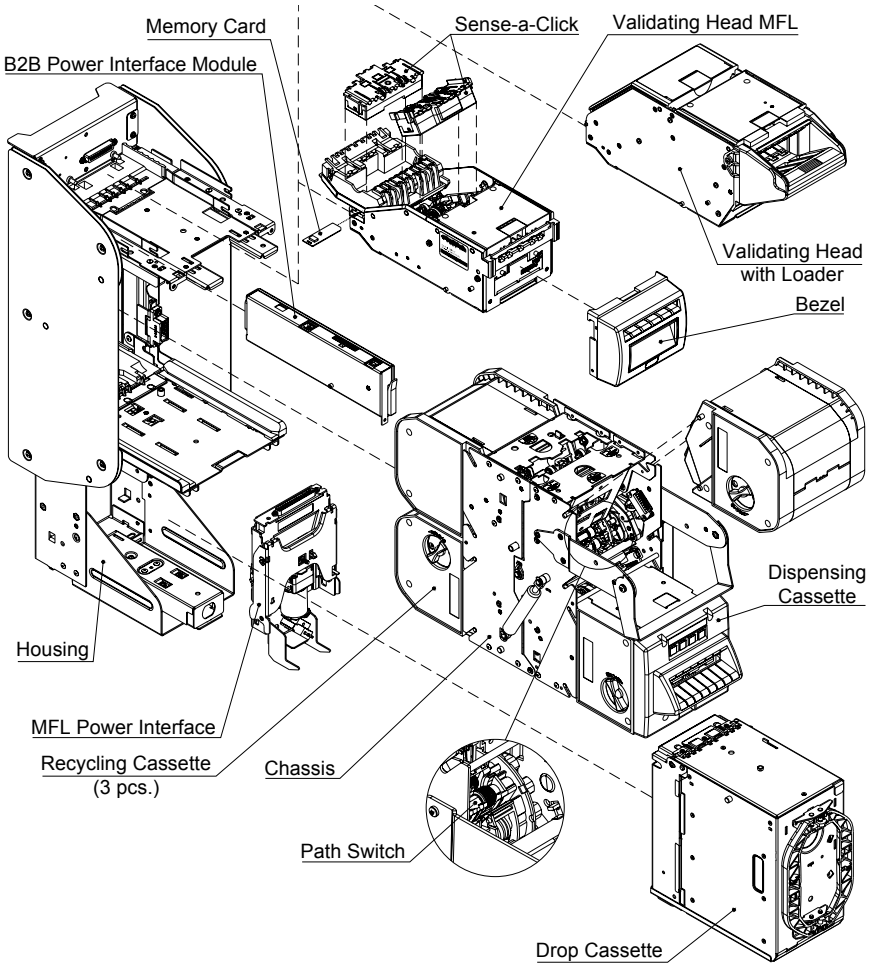


Fig. 2

All modules (except for the housing) can be easy removed and replaced if needed (i.e.: should a bill become jammed).

Housing

The Bill-to-Bill **housing** carries all of the modules and cables necessary for interconnections. The housing is the only module in the Bill-to-Bill that is permanently installed inside a cabinet.

There are security switches in the housing:

1. "drop cassette removal",
2. "drop cassette lock open", (if the locking mechanism for the drop cassette is present),

For switch connection, please refer to the ***"INSTALLATION. SECURITY FEATURES"***. Depending on the supporting bracket for the drop cassette, the following implementations of the housing are available:

Part Number	Bezels	Drop Cassette size	Locking mechanism
BBHR3110	Plastic	1000	NO
BBHR3513	Metal	1000	YES
BBHR3514	Plastic	1000	YES

Maintenance of the Housing.

There is no procedure designated for this module.

Chassis

The **chassis** carries 3 recycling cassettes, one dispensing cassette, and one path switch. It also has drive arrangements—for transporting bills, recycling cassettes, and positioning the path switch—as well as connection cables and a local controller.

Part Number	Number of Recycling Cassettes
BBCR0110	3

Removing the Chassis from the Housing

- Unlock the tubular lock at the front of the dispensing module (if present)
- Push the release bar under the validating head
- Pull out the chassis

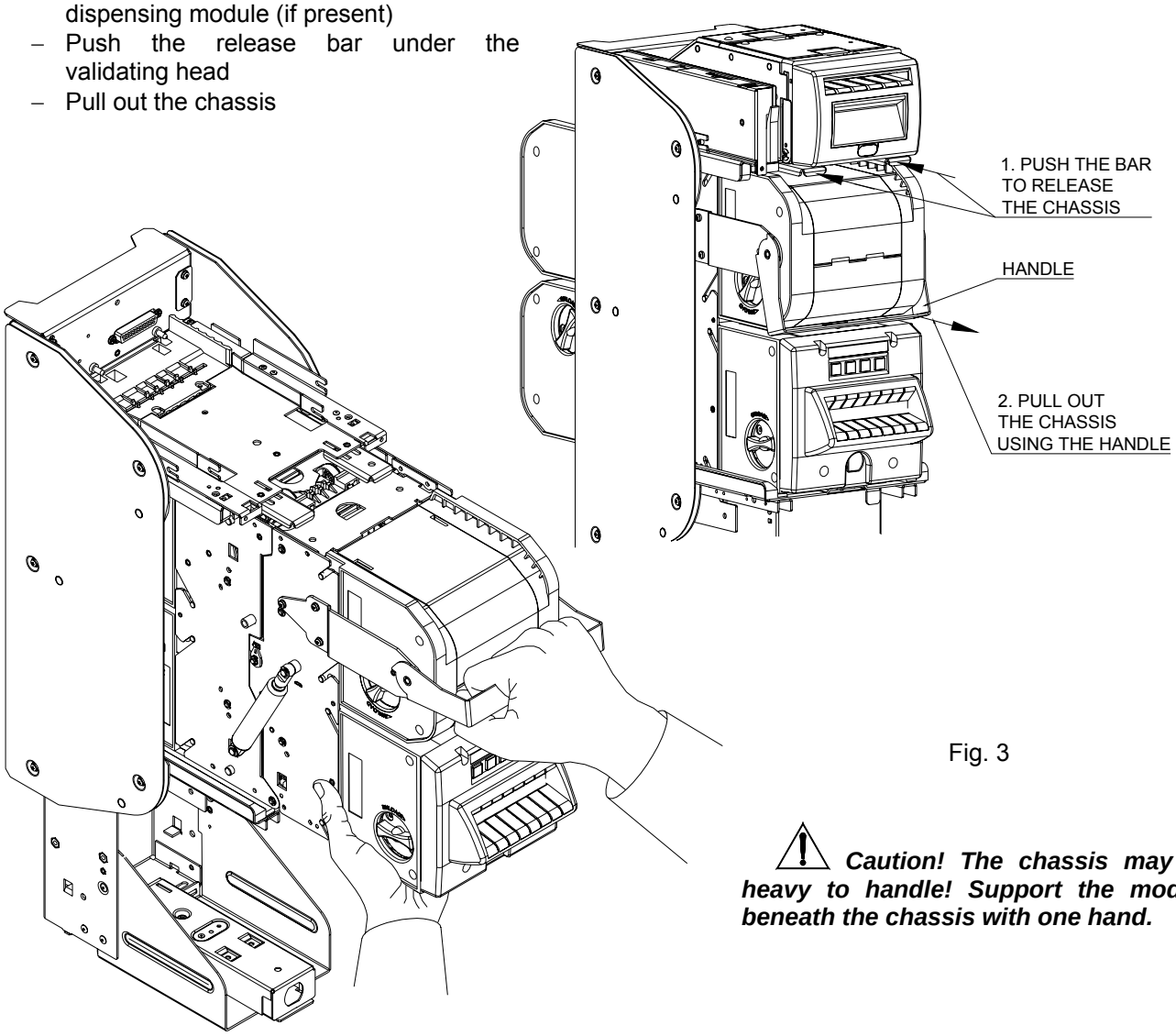


Fig. 3

Caution! The chassis may be heavy to handle! Support the module beneath the chassis with one hand.

Accessing the Bill Path:

Press either release button and pull open the machine. The gas spring supports the chassis in the opened position. The opened chassis also allows access to the path switch. The chassis can be opened with, or without, the recycling and dispensing cassettes present.

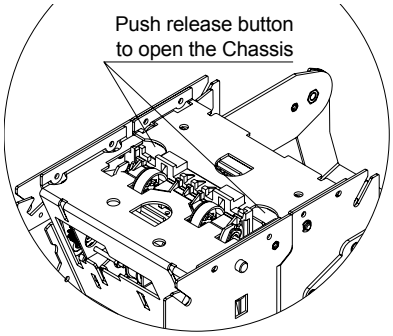


Fig. 5

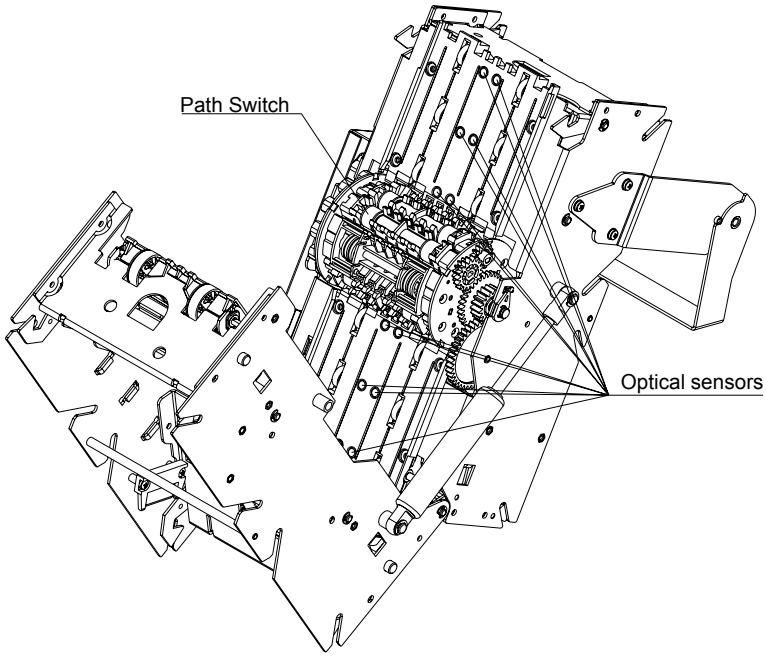


Fig. 6

Maintenance of the Chassis

The maintenance of the chassis is recommended approximately two times per year.
The preventative maintenance includes:

- visual inspection of timing belts
- visual inspection of gears
- visual inspection of optical sensors

There must not be any cracks on the surface of the four timing belts; no dust or dirt on the surface of the optical sensors (6 sensors at each guide, for a total of 24 sensors), and no visible damage of the gears. Optical sensors should be cleaned with a soft cloth and isopropyl alcohol.

Recycling Cassette

The Bill-to-Bill carries up to three **recycling cassettes**, which operate identically. Built with flexibility in mind, the user can program which bill denominations will be used in each of the recycling cassettes.

The maximum storage capacity of each cassette ranges from 80 to 110 bills. The exact number of bills that can be stored is dependent upon the bill length: the shorter the bill, the higher the number of bills that can be placed inside the cassette.

A flash memory inside each recycling cassette stores information on the number, and denomination of bills housed in the cassette. The flash memory prevents operation errors from occurring, i.e.: when a cassette is installed in a random position in the Bill-to-Bill.

Part Number	Bill storage capacity
BBRR0110	80 - 110

Removing the Cassette:

- Remove the chassis from the Bill-to-Bill housing first (see section entitled “chassis”)
- Slide the latch on the chassis (each cassette has its own latch) and pull out the cassette

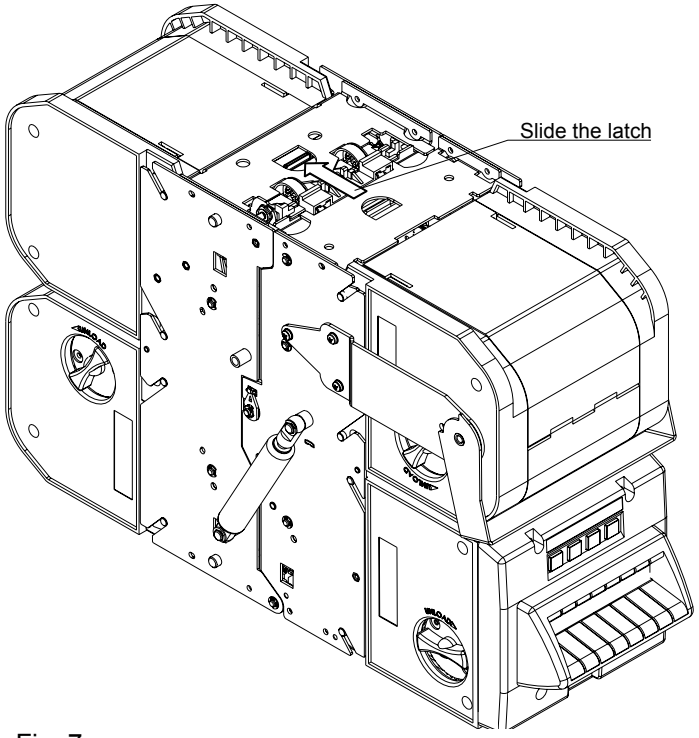


Fig. 7

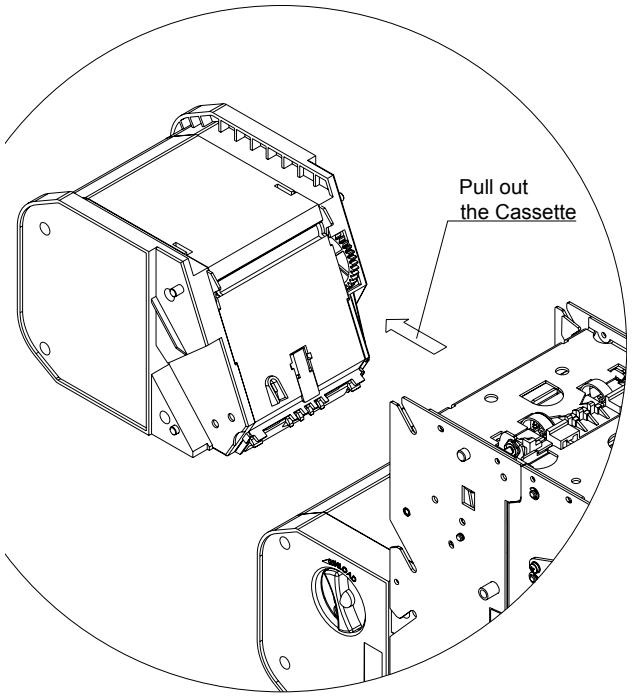


Fig. 8

Opening the Cassette:

Pull the metal latch, and open the front cover of the cassette.

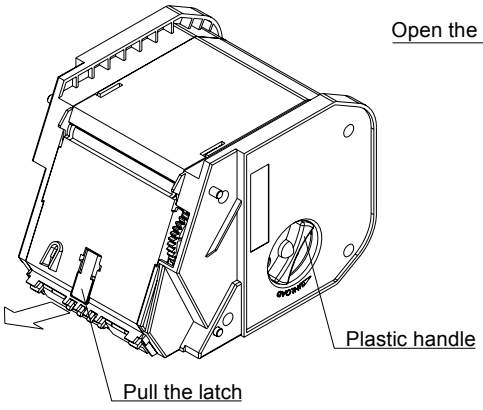


Fig. 9

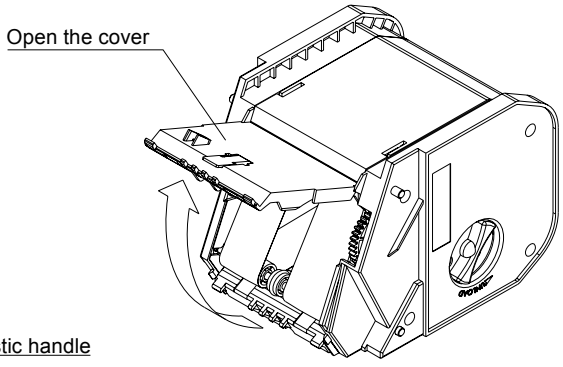


Fig. 10

Manually Unloading Cassettes:

Rotate the plastic knob in counter-clockwise direction. Bills are manually dispensed one bill at a time. Should a jammed bill be located in the entrance slot, this bill can be easily removed without adversely affecting the later operation of the cassette. Please note: manually unloading bills will reduce the number of bills in the cassette, without changing the number of bills in flash memory. It is strongly recommended to perform a complete unload

operation, after the cassette is replaced in the Bill-to-Bill (please see the "Unloading Options" section). This will allow the Bill-to-Bill to readjust the flash memory when the cassette is operational again.

Caution. Do not attempt to pull out the white tapes present in the cassette! This could damage the cassette!

Maintenance of the Recycling Cassette
The maintenance is recommended approximately two times per yearand includes:

- visual inspection of tapes
- visual inspection of input optical sensors

A mechanism within the cassette keeps the tapes tight at all times, which provides sufficient support for stored bills. Should any tape begin to sag, this can be easily corrected during service by simply rotating the plastic knob on the cassette in any direction. This action will cause the mechanism inside the cassette to retighten.

For optimal performance, there must not be any dust or dirt on the surface of the input optical sensors. (There are two sensors at each side of the entrance slot, for a total of four sensors.) Input optical sensors may be cleaned with a soft cloth and isopropyl alcohol once the front cover is open.

Dispensing Cassette

There is only one **dispensing cassette** in the Bill-to-Bill unit. In contrast to the three recycling cassettes, the dispensing cassette has a permanent position in the chassis. The dispensing cassette can form a bundle of up to 20 bills. Bills from all three recycling cassettes can be combined into one bundle. Should more than 20 bills need to be dispensed, then subsequent bundles will be delivered to the dispensing cassette once the previous bundle is removed.

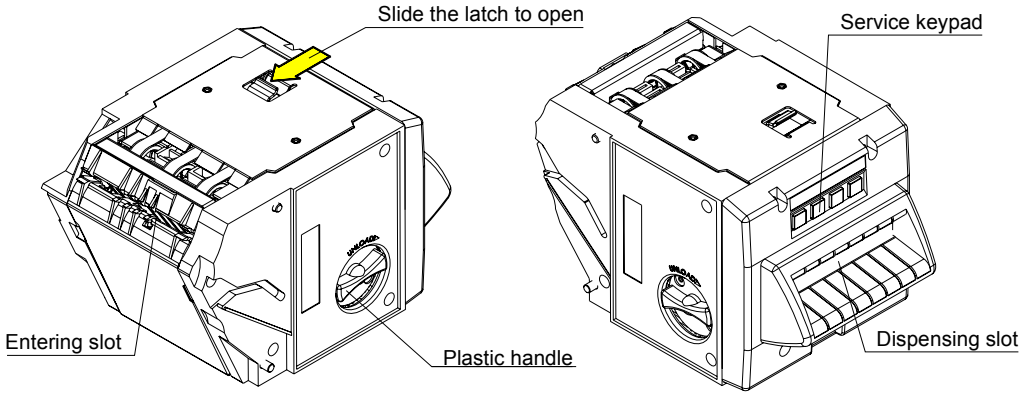


Fig. 11

A standard ¾" tubular lock can be installed in the dispensing cassette, which will allow the **chassis** to be secured to the **recycling cassette module**, and the **dispensing cassette** inside the housing. There is a placement for a lock under the dispensing slot.

Part Number	Maximal bundle size, bills	Bezels
BBDR0110	20	Plastic
BBDR0310	20	Metal

Removing the Dispensing Cassette:

- Remove the chassis from the housing first (please see section above)
- Slide the latch on the chassis and pull out the cassette

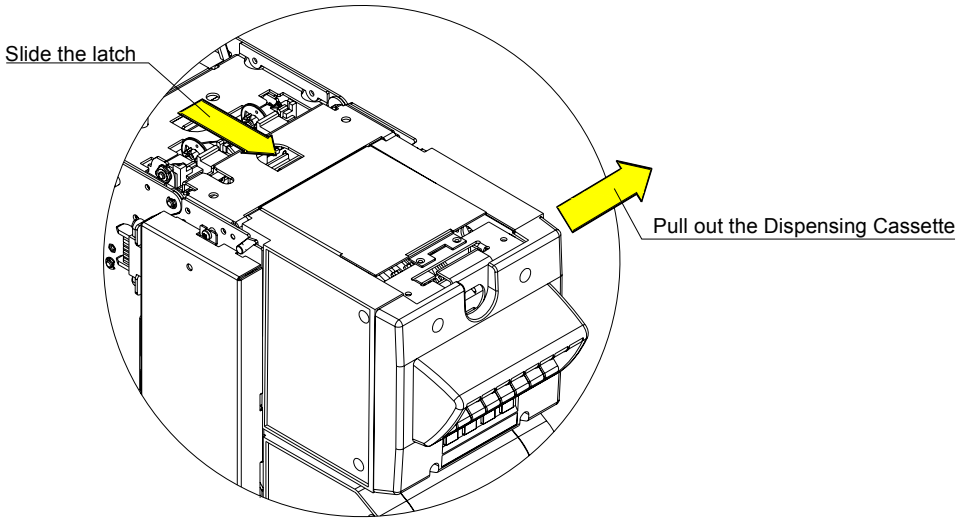


Fig. 12

Opening the Dispensing Cassette:

Slide the metal latch (as shown in Fig. 11) and open the top cover of the cassette.

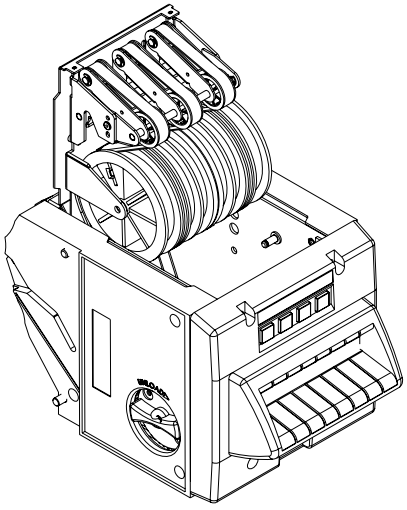


Fig. 13

Maintenance of the Dispensing Cassette:

Preventative Maintenance of the dispensing cassette is recommended approximately two times per year.

Maintenance should include visual inspection of belts. Also, there must not be any cracks on the surface of any of the 8 timing belts, and no visible damage of any of the components.

Path Switch

The **path switch** organizes connections between modules via various bill paths.

Possible bill path directions are:

- from validating head to recycling cassette 1
- from validating head to recycling cassette 2
- from validating head to recycling cassette 3

- from validating head to drop cassette

- from recycling cassette 1 to dispensing cassette
- from recycling cassette 2 to dispensing cassette
- from recycling cassette 3 to dispensing cassette

- from recycling cassette 1 to drop cassette
- from recycling cassette 2 to drop cassette
- from recycling cassette 3 to drop cassette

- from recycling cassette 1 to recycling cassette 2
- from recycling cassette 1 to recycling cassette 3

- from recycling cassette 2 to recycling cassette 1
- from recycling cassette 2 to recycling cassette 3

- from recycling cassette 3 to recycling cassette 1
- from recycling cassette 3 to recycling cassette 2

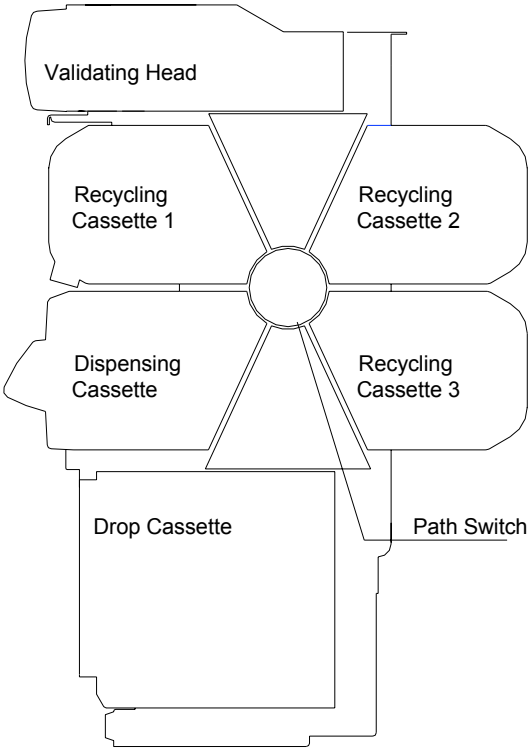


Fig. 14

Part Number	Number of connected paths
BBSR0110	6

Removing the Path Switch:

Remove the chassis from the housing first (please see section above)
- Open the chassis (please see Fig. 6)
- Pull the tab and rotate the bearing 90 degrees, as shown in Fig 15.
- Repeat the action with the second bearing at the opposite side of the chassis
- Once both bearings have been released, ***carefully*** pull out the path switch from the chassis

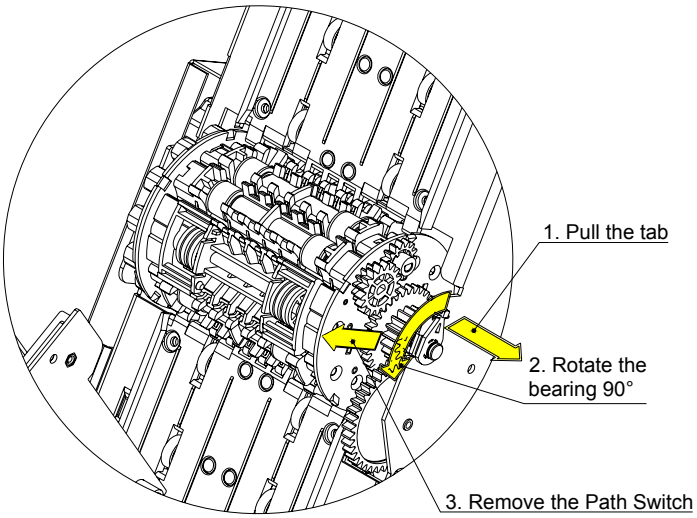


Fig. 15

Maintenance of the Path Switch:

The maintenance of the path switch is recommended approximately two times per year.
Preventative Maintenance includes visual inspection of belts.
There must be no cracks on the surface of the 8 timing belts, and no visible damage of the components.

Bill-to-Bill Power Interface Module

The **Bill-to-Bill power interface module** is placed in the housing at the left side of the validating head. It carries connectors for all external connections to the Bill-to-Bill.

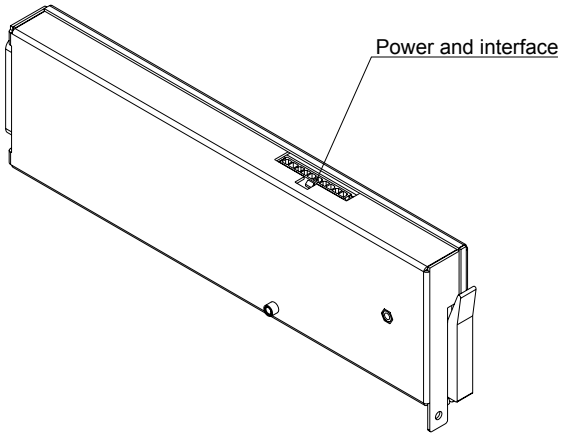


Fig. 16

Part Number	Interface	Power
BBPR5713	RS232	24V DC

Removing the Bill-to-Bill Power Interface Module:

- Remove the screw under the Bill-to-Bill power interface at the front side
- Pull the latch of the Bill-to-Bill power interface module to remove it from the housing

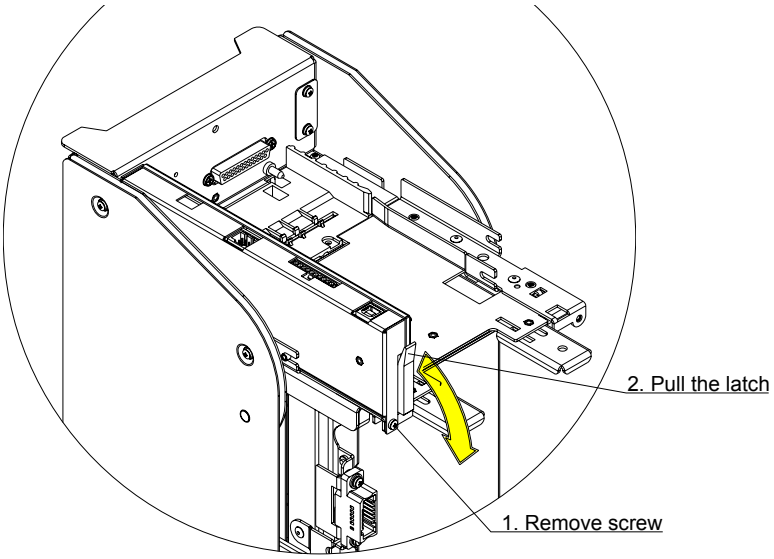


Fig. 17

Maintenance of the Bill-to-Bill Power Interface Module:

There is no maintenance procedure designated for this module.

Drop Cassette

The Bill-to-Bill can utilize one **drop cassette**; this is the same cassette used in CashCode's FrontLoad bill validator model.

The **drop cassette** stores validated bills and coupons and holds them in a stacked formation. It has a stacking mechanism, and is typically equipped with a plastic lock. Users are encouraged to replace the plastic lock with a regular metal one. Users also have a choice between one lock—or two locks for added security. A locking mechanism allows for the installation of a user's security locks (specifically, one or two 3/4" tubular locks measuring $1^{1}/_{16}"\pm{}^{1}/_{16}"$ or $1^{1}/_{8}"\pm{}^{1}/_{16}"$).

The capacity of the drop cassette is 1000 bills. Street grade bills require more space and as a result, may lessen the overall capacity. The drop cassette is supplied with a foldable handle, but where space inside the machine is limited, a premium drop cassette may be ordered without a handle.

The drop cassette can store bills from 62 to 82 mm wide, and from 140 to 172 mm long. For bills from 125 to 150 mm in length, a modified drop cassette may be ordered. However, when accepted bill are 125 to 172 mm long, the drop cassette for 140-172 mm range must be chosen.

The drop cassette may be ordered with mounting parts for installation of a Touch Memory (Dallas Chip) option. The Dallas Chip is located in the cassette housing. The proper type of power interface module must be ordered in order to communicate with the Dallas Chip. Drop cassette selection is dependent on which housing is present in the unit.

⚠ ***The Drop Cassette is not included with the Bill-to-Bill and must be ordered separately.***

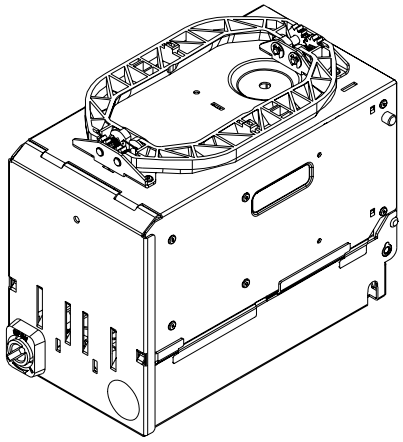


Fig. 20

Drop Cassette with foldable handle

Part Number	Cassette capacity, bills	Bill length, mm	Handle	Dallas Chip
FLCR603	1000	140 to 172	Foldable	No

For other drop cassettes please contact the CashCode Customer Service department.

Removing the Drop Cassette (Fig. 21):

1) Open the lock in the housing (if equipped)
2) Push the release button
Grasp handle and pull out the drop cassette

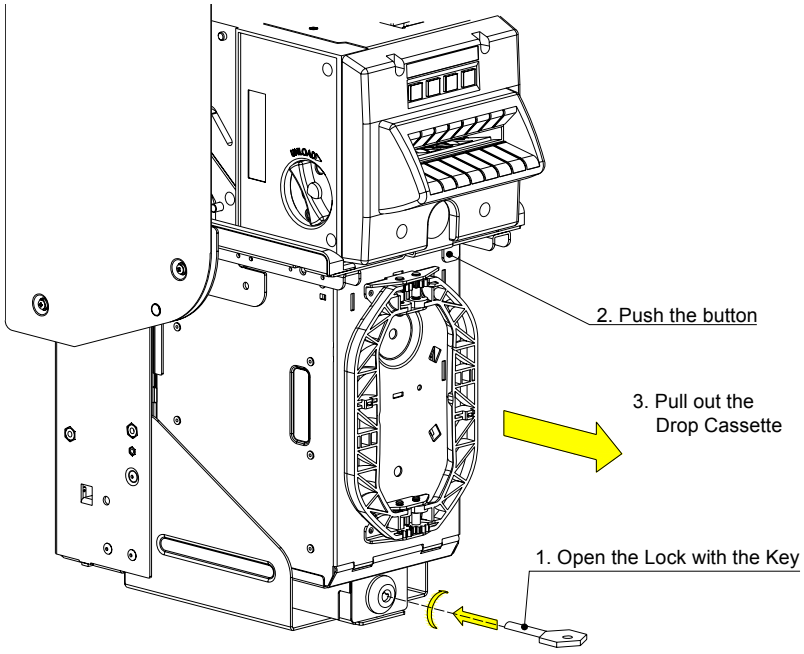


Fig. 21

Collecting bills:

1. Unlock 1 (or 2 locks) and open the cover

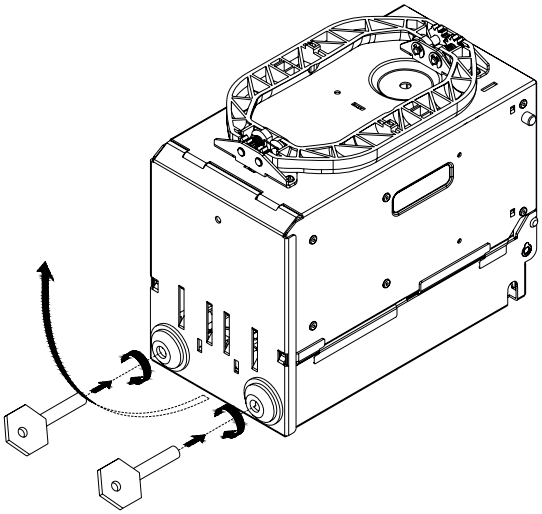


Fig. 22

2. Remove bills

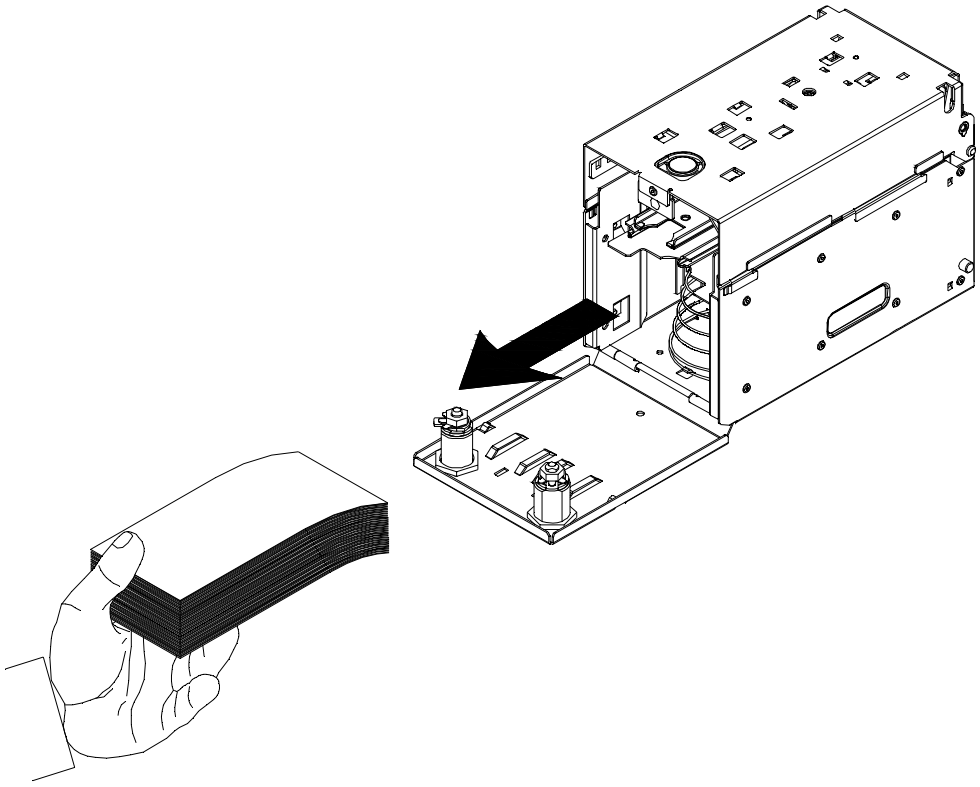


Fig. 23

Maintenance of the Drop Cassette:

There is no maintenance procedure designated for the drop cassette.

Bezel

Any **bezel** that was designed for CashCode's FrontLoad bill validator can be used with the Bill-to-Bill Currency Management System. It is recommended however to use a bezel with digital display, as this option is a more convenient way to manually control the Bill-to-Bill (i.e.: software update, diagnostics, unloading, etc.).

Several **bezel** designs are available in order to make the CashCode Bill-to-Bill compatible with different door styles. Typically the Bill-to-Bill is supplied with a CashCode bezel featuring runway lights and a digital display. The bezel is permanently attached to the validating head.

Standard CashCode Bezel:
The status indication light is provided

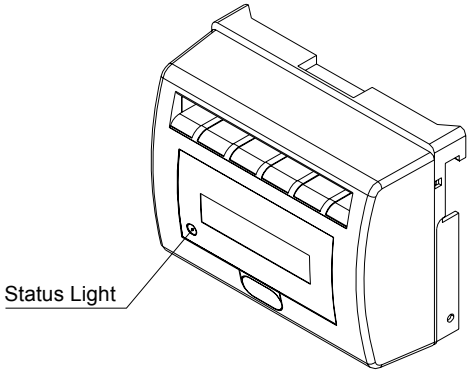


Fig. 24

CashCode Bezel with Runway Lights:
The status light is combined with a running light wave in the entryway

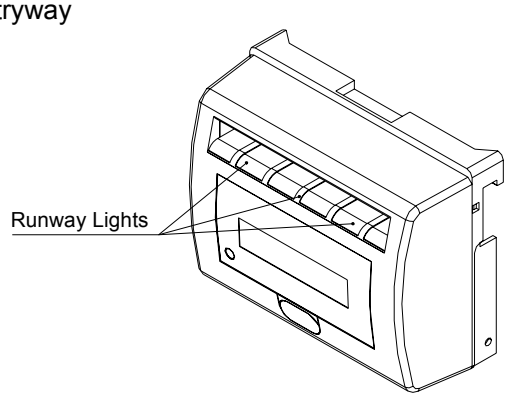


Fig. 25

CashCode Bezel with Runway Lights and Digital Display:
In addition to running lights, a digital display of 2 lines (16 characters each) is provided.

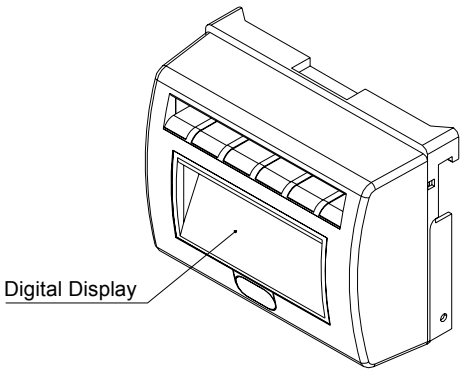


Fig. 26

Metal Bezel

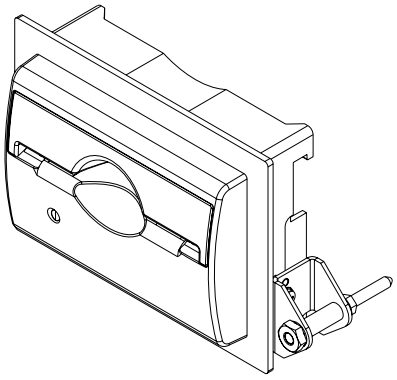


Fig. 27

Part Number	Features
MFLBR2401	CashCode Standard Bezel
MFLBR2201	CashCode Bezel with Runway lights
MFLBR3201	CashCode Bezel with Digital Display
MFLBR7102	CashCode Metal Bezel with GND

Maintenance of Bezels:

There is no maintenance procedure designated for bezels.

Validating head

The **validating head** for the Bill-to-Bill was adopted from CashCode's FrontLoad bill validator unit.

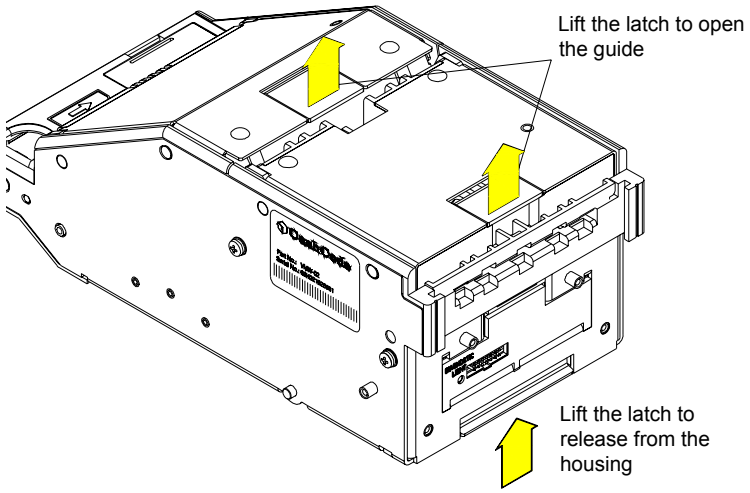


Fig. 29

The Bill-to-Bill's validating head features self-centering transport guides, which perfectly align multi-width and skewed bills. The width of the bill path automatically adjusts to accommodate each bill.

Accessing bill path:

There are two guides in the validating head that must be opened to access the bill path. If space above the Bill-to-Bill allows, the guides in the validating head can be opened without removing the validating head from the housing. Otherwise the validating head must be removed from the housing.

To remove the validating head from the housing lift the latch at the bottom of the validating head and pull out the validating head.

To open the guides lift the latch at top of each guide and rotate the guides as shown in Fig. 30.

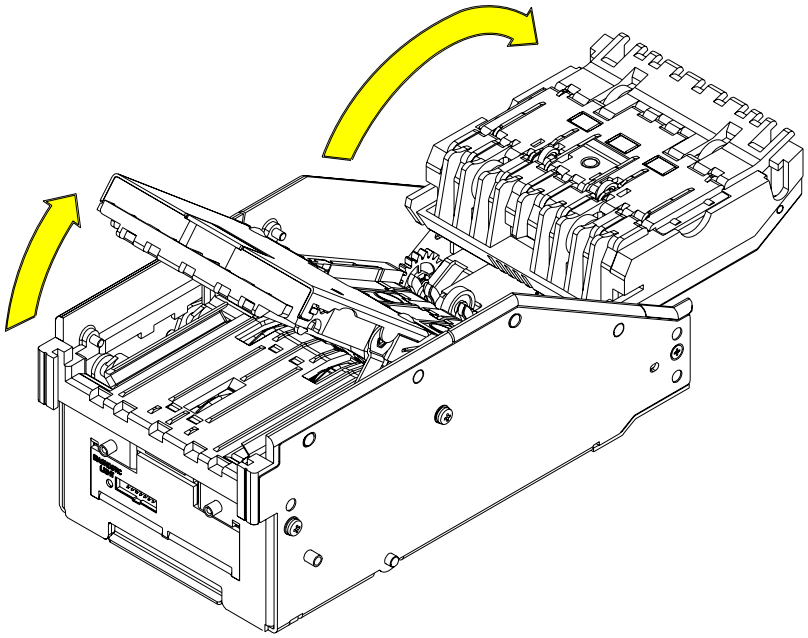


Fig. 30

Part Number	Description
MFLVR2110	Multi-width centering mechanism

Maintenance of the Validating Head:

Maintenance of the validating head is recommended approximately two times per year.
Preventative Maintenance includes visual inspection of the bill path and transport rollers:

Pull out the validating head from the housing (the latch for releasing the validating head is located under the validating head at the front side)
Open the upper guides at the validating head
There must not be any scratches present on the guides and optical sensors
There must not be any cracks present on the visible surface of the transport rollers
There must not be any dirt visible on the surface of the optical sensors. Dirt should be removed with a soft cloth and isopropyl alcohol

Sense-a-Click™ Modules

"Sense-a-Click™" sensor packs are a set of two modules—one upper and one lower. In order to be compatible with each other, both modules must have the same part and model number.

The Sense-a-Click™ set is identified by:

- Color and position of the optical sensors
- Number and position of the inductive sensors
- Capacitive sensors
- Model, which reflects the type of electronics housed therein, and determines the compatibility with other modules

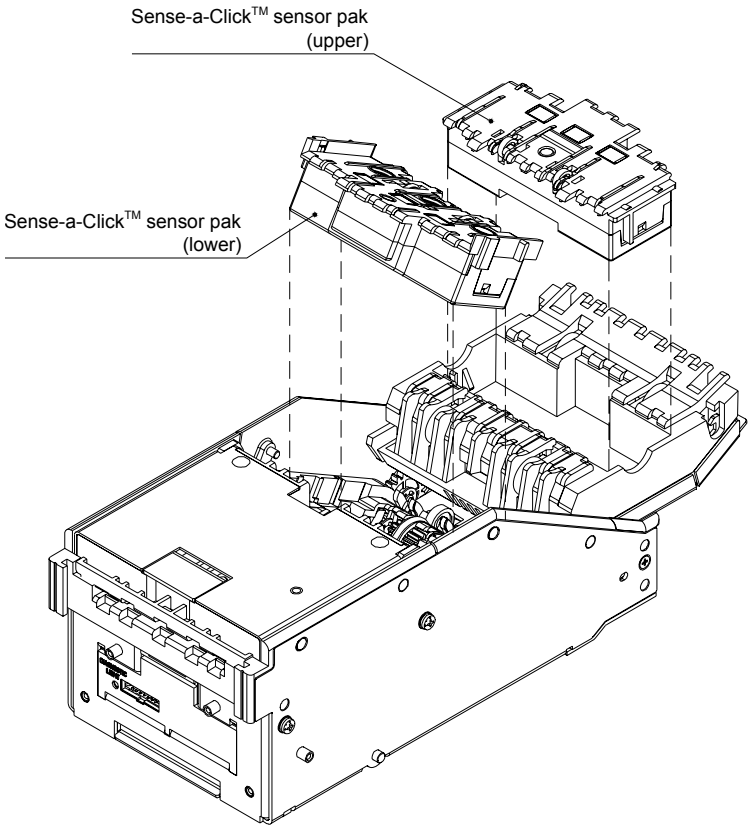


Fig. 31

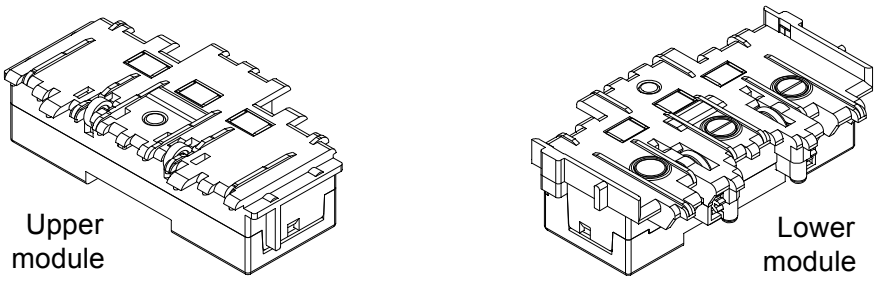


Fig. 32

Depending on the bill country type, the following Sense-a-Click™ part numbers should be used:

Currency		Part Number for Sense-a-Click™ Sensor Paks		
		Set of Two Modules	Upper Module	Lower Module
Argentina	AR	FLSR1704	FLSR1704U	FLSR1704L
Australia	AU	FLSR1704	FLSR1704U	FLSR1704L
Brazil	BR	FLSR1704	FLSR1704U	FLSR1704L
Canada	CA	FLSR1801	FLSR1801U	FLSR1801L
Chile	CL	FLSR1704	FLSR1704U	FLSR1704L
China	CN	FLSR1705	FLSR1705U	FLSR1705L
China + Hong Kong	CNHK	FLSR1705	FLSR1705U	FLSR1705L
Colombia	CO	FLSR1704	FLSR1704U	FLSR1704L
Dominican Republic	DO	FLSR1704	FLSR1704U	FLSR1704L
European Union (Euro)	EU	FLSR1704	FLSR1704U	FLSR1704L
Great Britain	GB	FLSR1704	FLSR1704U	FLSR1704L
Hong Kong	HK	FLSR1705	FLSR1705U	FLSR1705L
Kazakhstan	KZ	FLSR1704	FLSR1704U	FLSR1704L
Mexico	MX	FLSR1705	FLSR1705U	FLSR1705L
New Zealand	NZ	FLSR1704	FLSR1704U	FLSR1704L
Philippines	PH	FLSR1704	FLSR1704U	FLSR1704L
Russia	RU	FLSR1704	FLSR1704U	FLSR1704L
Scotland	SL	FLSR1704	FLSR1704U	FLSR1704L
South Africa	ZA	FLSR1704	FLSR1704U	FLSR1704L
Ukraine	UA	FLSR1704	FLSR1704U	FLSR1704L
USA	US	FLSR1704	FLSR1704U	FLSR1704L
USA + Canada	USCA	FLSR1901	FLSR1901U	FLSR1901L
USA + Great Britain	USGB	FLSR1704	FLSR1704U	FLSR1704L
USA + Mexico	USMX	FLSR1704	FLSR1704U	FLSR1704L
Venezuela	VE	FLSR1705	FLSR1705U	FLSR1705L

Maintenance of the Sense-a-Click™ Module:

Maintenance of Sense-a-Click™ modules is recommended at the same time as the maintenance of the validating head. For a detailed description of the procedure, please refer to the section entitled “Maintenance of the Validating Head”.

Power Interface Module

The **Power Interface module** for the Bill-to-Bill is adopted from the CashCode FrontLoad bill validator unit.

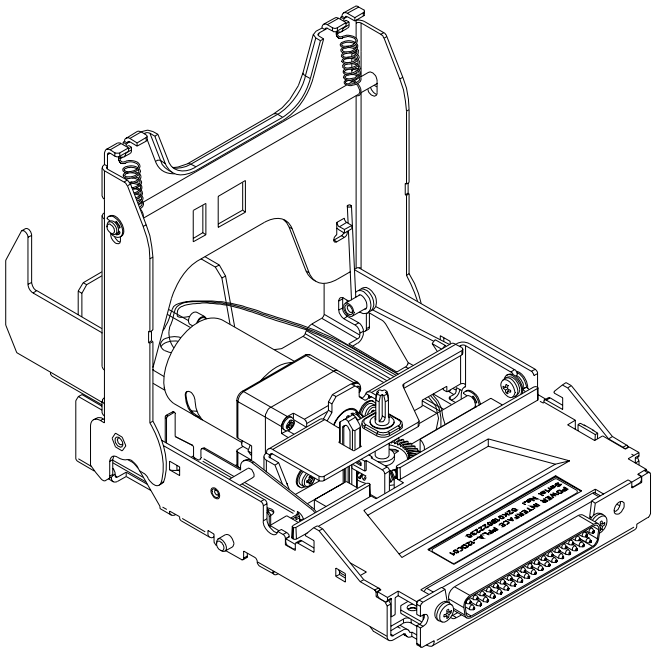


Fig. 33

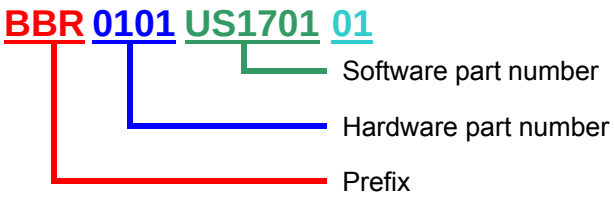
Part Number	Power	Interface
FLPR5711	24 VDC	RS232

Maintenance of the Power Interface Module:
There is no maintenance procedure designated for the Power Interface module.

NUMBERING SYSTEM

Depending on currency, interface and available features, Users can choose the Bill-to-Bill that best matches their needs.

Complete part numbers for the Bill-to-Bill consist of two parts: a hardware part number and a software part number. The part number looks like this:



The **prefix** defines the device class. In this instance, “BB” means Bill-to-Bill Currency Management System.
The **hardware part number** reflects the contents of the Bill-to-Bill (ie. the particular combination of modules).
The **software part number** reflects the country (currency), communication protocol and Chassis’ software version.

INSTALLATION

Mechanical installation

Only the Housing of the Bill-to-Bill Currency Management System must be permanently secured in a cabinet. All the other modules are connected to the housing. The housing has three mounting holes at each of the sidewalls, and two mounting holes at the bottom. For exact locations of these holes, please refer to the outline drawings in this manual.

It is recommended to use three holes at any of the sidewalls, and two holes at the bottom (Fig. 34 and Fig. 35).

M5 fasteners (metric) or 10-24 (imperial) should be used.

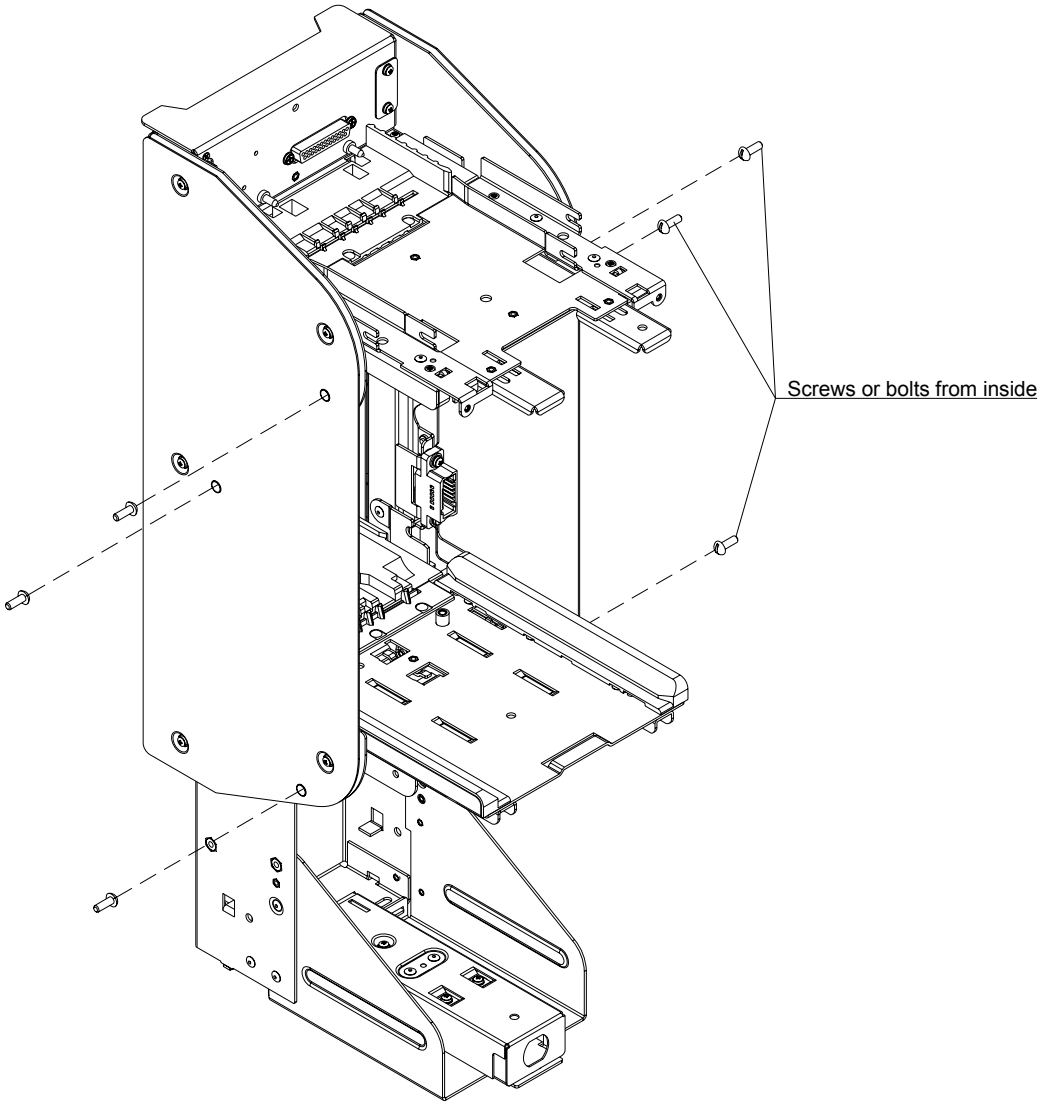


Fig. 34

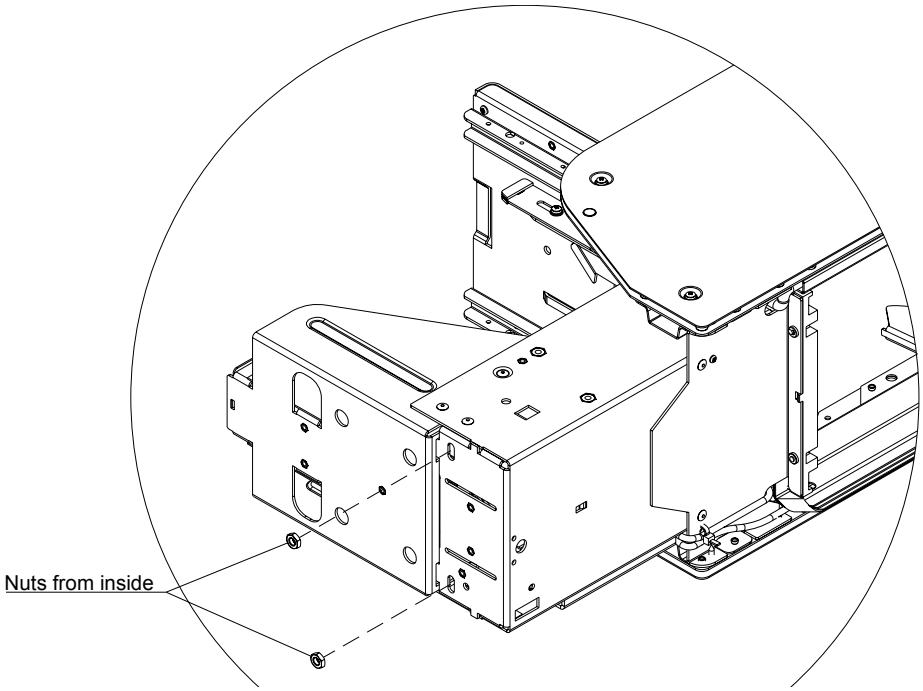
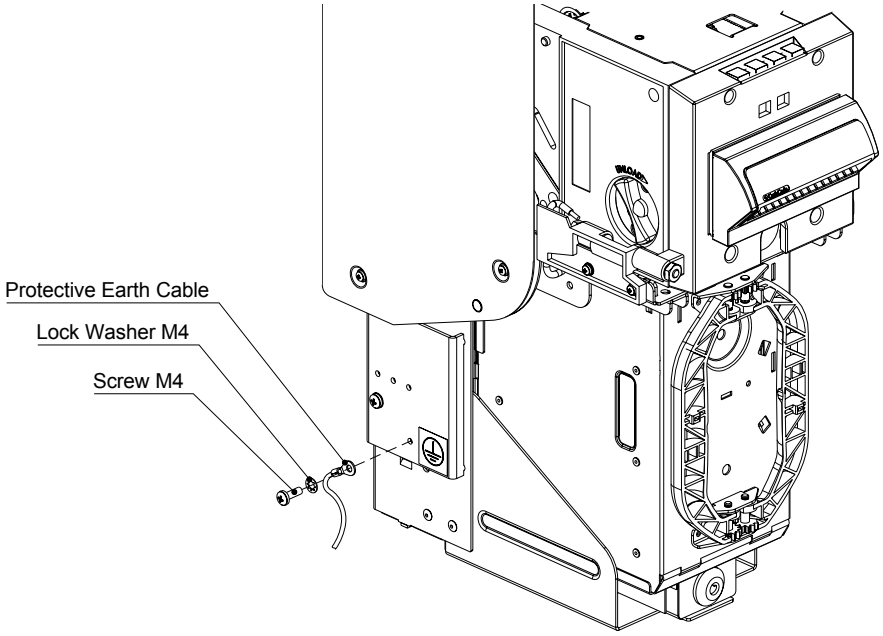


Fig. 35

Grounding of BBHR3513

Protective-earth ground terminal must be connected to the automat grounding bus or terminal. Protective earth connection must be made by cable OPT-MKSM-GND or another cooper wire cable with wire gage 14…12 AWG. Use the shortest, practical wire length but no more than 1.5 meters. Refer to local codes and regulations for grounding requirements.



Security features (locks and security switches)

The Bill-to-Bill Currency Management System has several security features.

The **drop cassette** can be locked with one or two ¾" tubular locks. The **drop cassette** can be also locked to the **housing** with a ¾" tubular lock. There can be two **security switches**: one detects the presence of the drop cassette in the housing, and another detects that the housing lock is secured in "locked" position.

The **chassis** within the recycling and dispensing cassettes can be locked in the housing with a ¾" tubular lock, positioned 5/8" from the mounting surface to a latch. The provision for the lock is located in the dispensing cassette. Neither recycling cassettes nor dispensing cassettes can be removed from the chassis, until the cassis is not removed from the housing.

Lock Installation in the Housing:

Step #1. Remove the screw and lock washer from the lock cover. DO NOT DISCARD! (Please see FIG. 36.)
Step #2. Remove and discard the washer and spacer (Fig. 36).
Step #3. Install the lock and parts, as shown in Fig. 37.
Step #4. Install the cover, screw and lock washer that were removed in Step #1 (please see Fig.38)

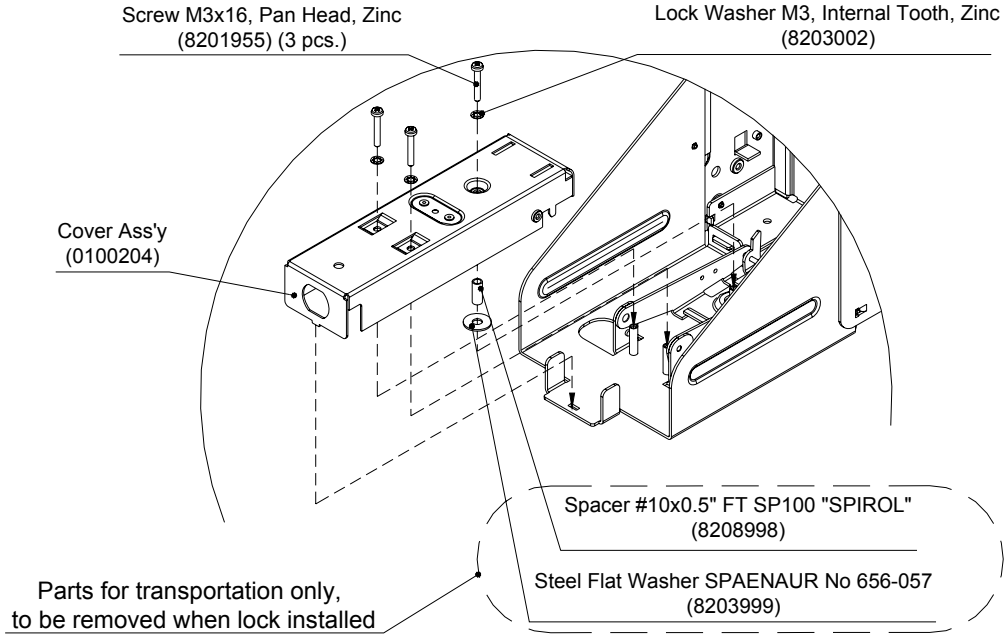
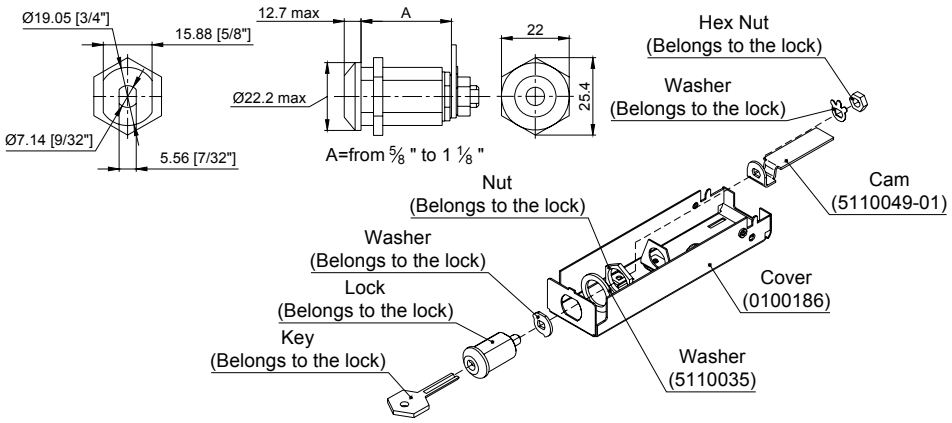


Fig. 36

Variant 1
Mounting kit
OPT-MKFL-FLH1,
that includes :
Cam 5110049-01,
Washer 5110035 is standard accessory.



Variant 2
Mounting kit
OPT-MKFL-FLH2,
that includes :
Cam 5110099;
Nut 5310021;
Plug 5206036,
Is optional (must be ordered)

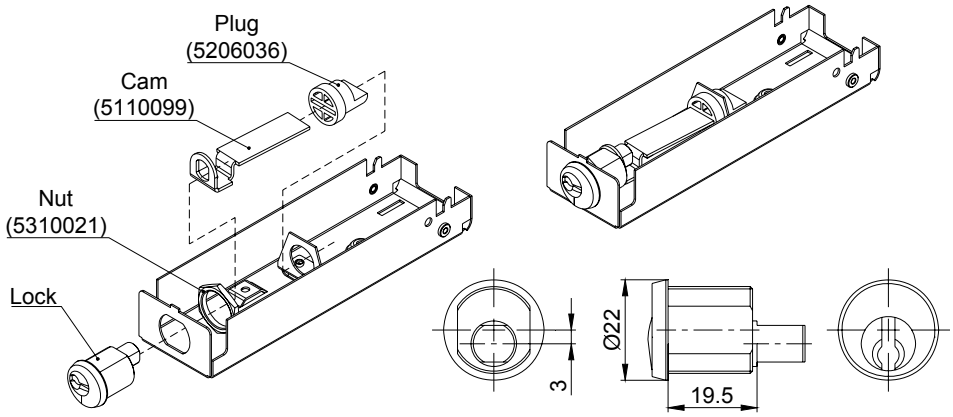


Fig. 37

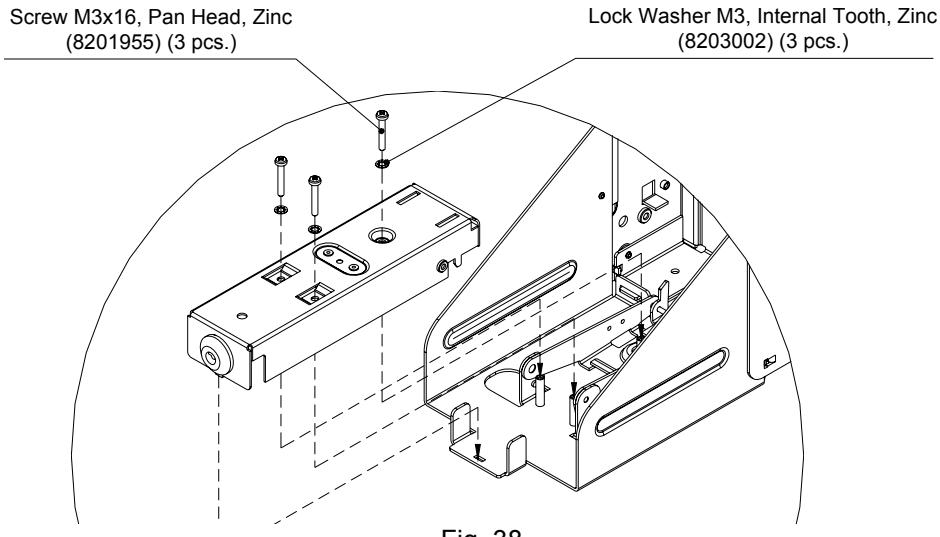


Fig. 38

Security Switch Connection (Fig. 39):

In order to connect to security switches, .110 Quick Connect Terminals will be needed, as specified in Fig. 39.

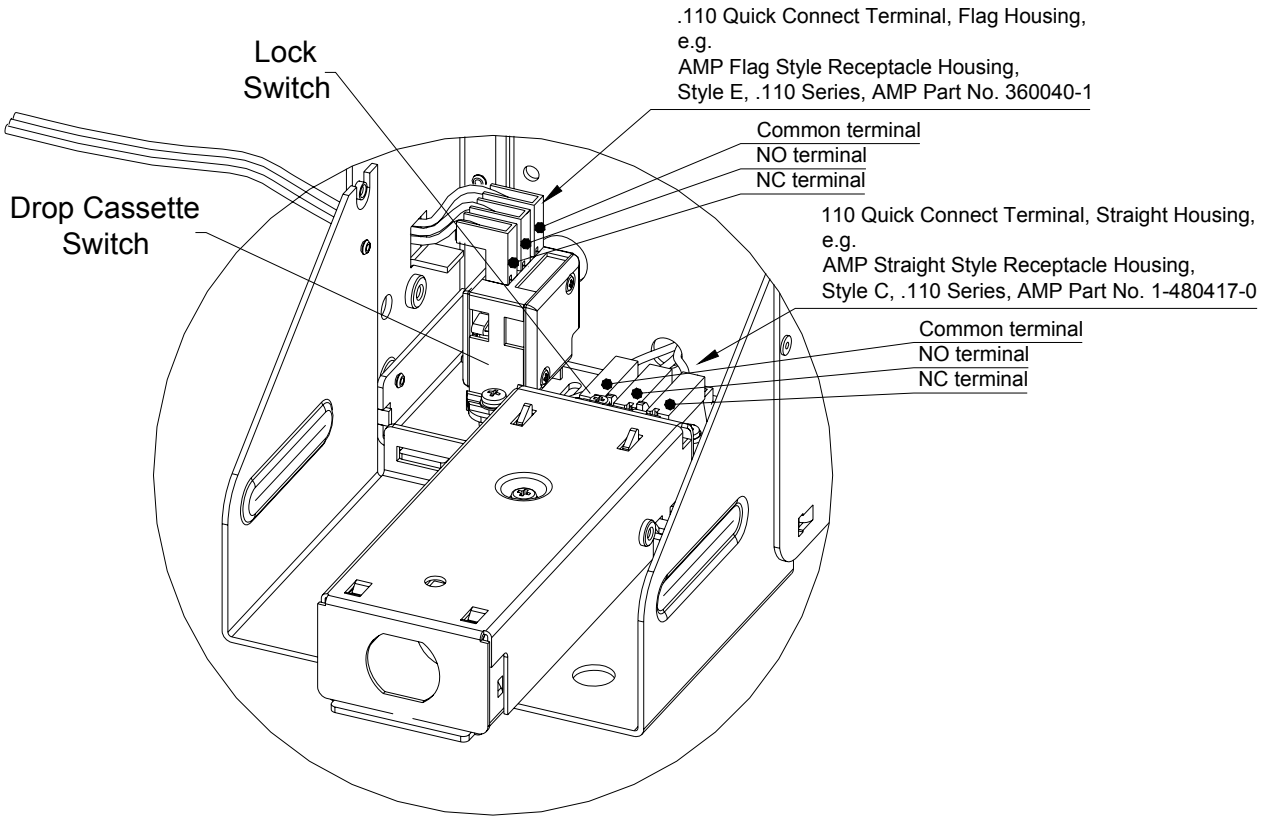

Lock Switch
Drop Cassette Switch
.110 Quick Connect Terminal, Flag Housing, e.g. AMP Flag Style Receptacle Housing, Style E, .110 Series, AMP Part No. 360040-1
Common terminal
NO terminal
NC terminal
110 Quick Connect Terminal, Straight Housing, e.g. AMP Straight Style Receptacle Housing, Style C, .110 Series, AMP Part No. 1-480417-0
Common terminal
NO terminal
NC terminal
Lock Switch Cable laying
Variant 1
Variant 2

Fig. 39

Lock Installation in Chassis:

Step #1. Remove the chassis from the housing
Step #2. Remove the dispensing cassette from the chassis
Step #3. Unscrew two screws and remove the lock bracket from the dispensing cassette (Fig. 41)
Step #4. Install the lock into the lock bracket (Fig. 42)
Step #5. Install the lock bracket into the dispensing cassette (Fig. 43)
Step #6. Install the dispensing cassette into the chassis

Step #7. Install the chassis into the housing

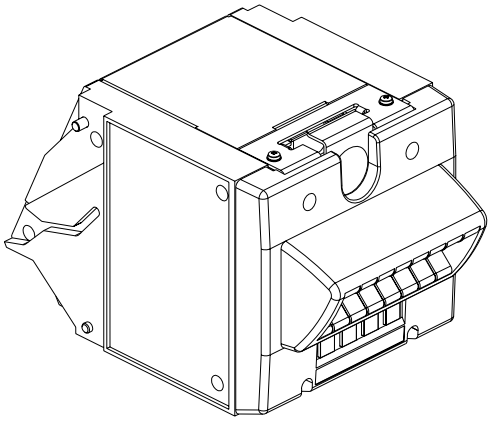


Fig. 40

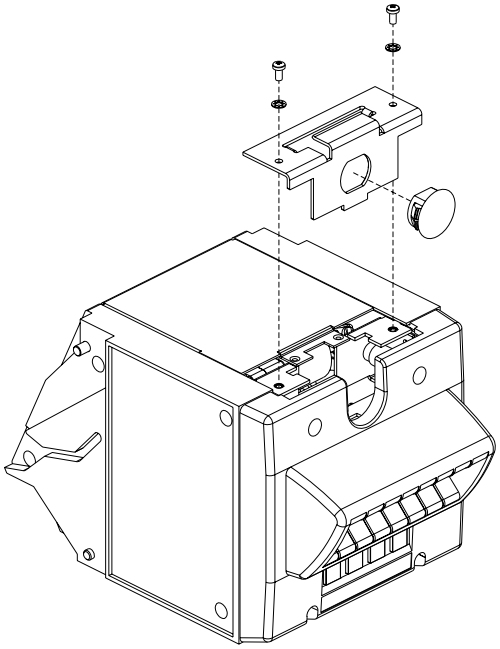
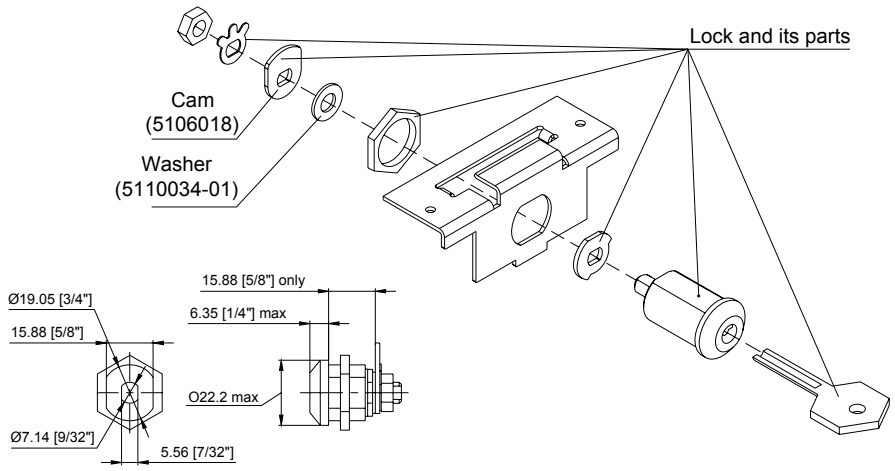


Fig. 41

Variant 1
Mounting kit
OPT-MK-BBD,
that includes :
Cam 5106018 ,
Washer 5110034-01
is standard accessory.



Variant 2
Mounting kit
OPT-MK-BBD1,
that includes :
Lock Washer 8203012;
Cam 5106033;
Nut 5310021;
Washer 5310022,
is optional.
(must be ordered)

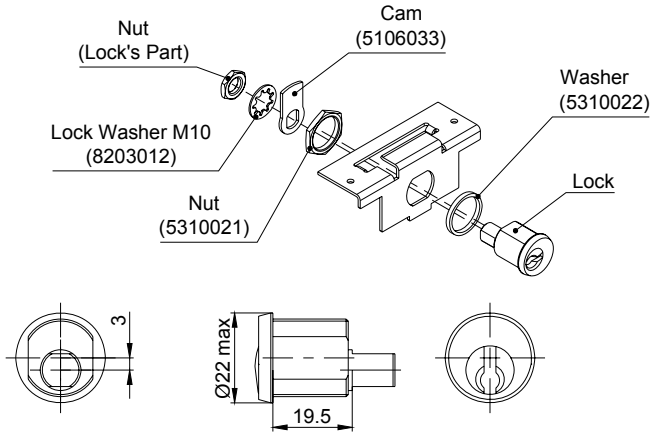


Fig. 42

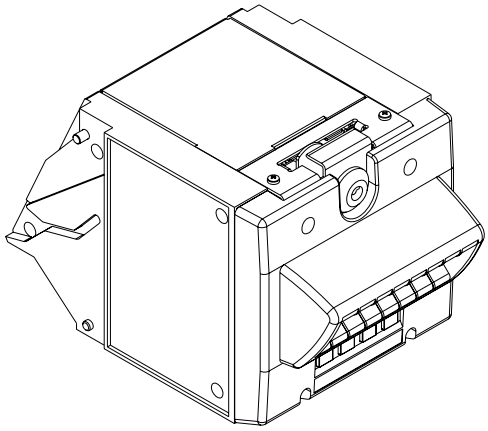


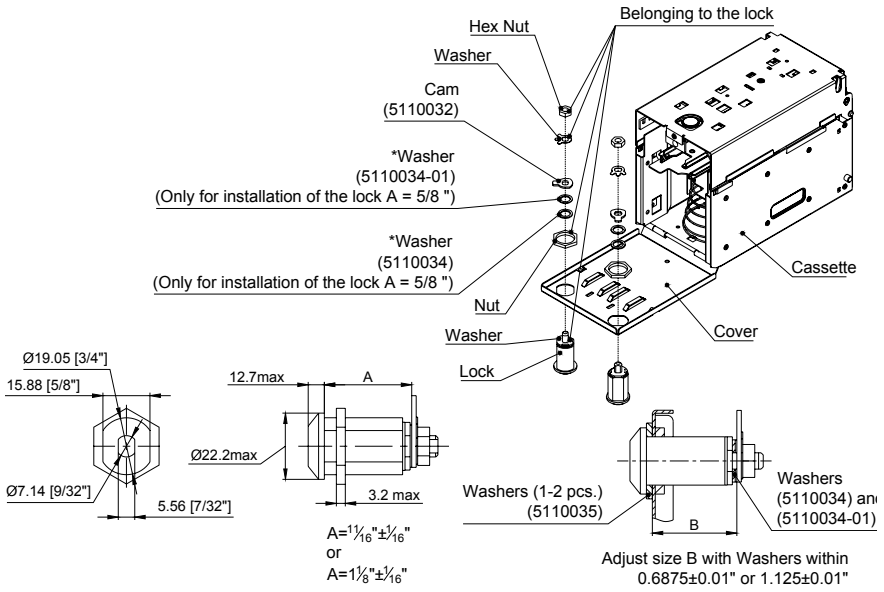
Fig. 43

Lock Installation in Drop Cassette

In order to install the security locks in the drop cassette, open the drop cassette cover, remove the plastic lock and plug, and follow the diagrams as below.

Variant 1

Mounting kit
OPT-MK-FLC
that includes :
Cam 5110032 2 pcs.
Washer 5110034 2 pcs.
Washer 5110034-01 4 pcs.
Washer 5110035 4 pcs.
is standard accessory.



Variant 2

Mounting kit (for each lock*)
OPT-MK-FLC1,
that includes :
Cam 5106034;
Nut 5310021;
Washer 5310022 is optional.
(must be ordered)

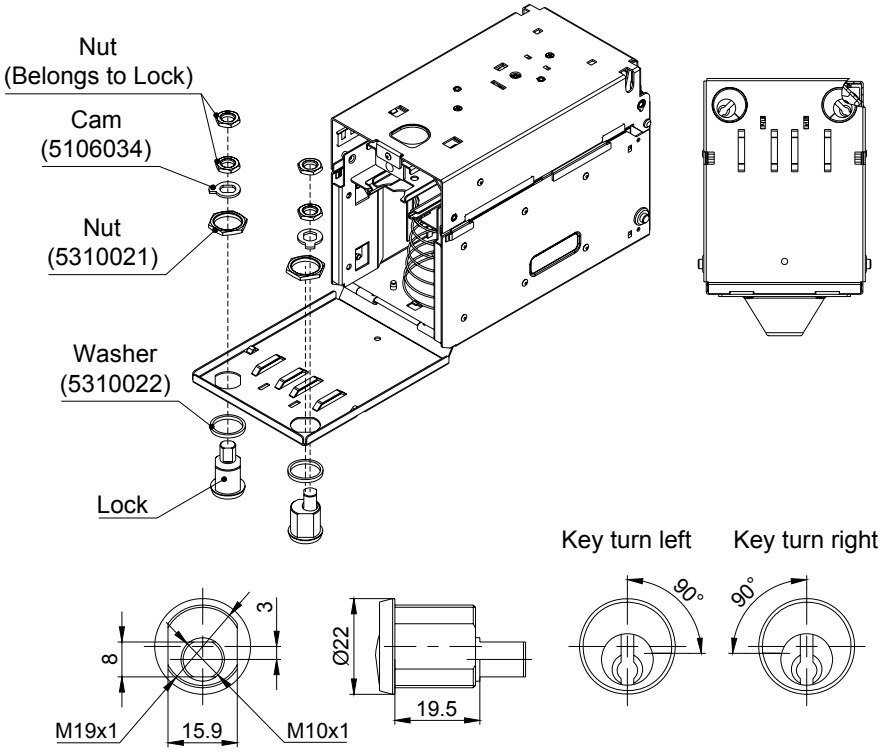


Fig. 44

POWER AND INTERFACE CONNECTION

The Bill-to-Bill power interface module has the following external connections:

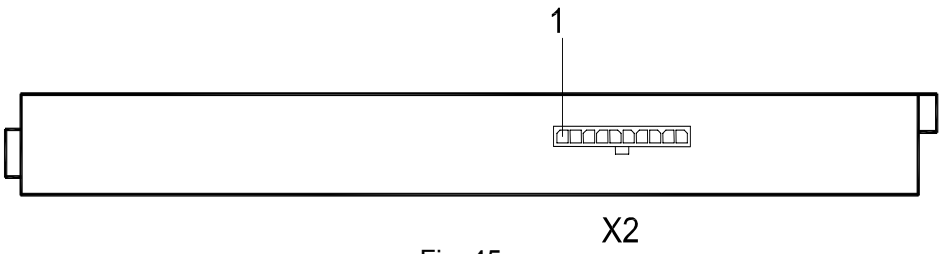


Fig. 45

X2, Molex p/n 43650-1000 (module portion)

TERMINAL	SIGNAL	FUNCTION
1	POWER + (24 V DC)	POWER
2	POWER + (24 V DC)	POWER
3	POWER - (0 V)	POWER
4	POWER - (0 V)	POWER
5	CHASSIS	Functional Earth
6	CHASSIS	Functional Earth
7	RXD	Host serial receive
8	TXD	Host serial transmit
9	M-RES	Master reset
10	GND	Interface common

Interface description

The Bill-to-Bill interface operates with RS232 levels and under CCNET protocol. A detailed description of the CCNET protocol can be found in the “CashCode NET Interface Manual”.

Power and Interface cables specification

The lengths of power and interface cables should not exceed 10 meters

Power and interface cables do not connect to outdoor communication links and to outdoor DC current lines.

As interface cable to use the shielded cable. The shield is connected to pin 6 of connector X2. The shield of another cable end is connected either to the case of Host or to the grounding bus or terminal of the automat near to Host Controller.

As power cable to use fourth core cable connected to pins 1, 2, 3 and 4 of connector X2. Each wire section should be not less AWG22. From the direction of the power supply the wires are connected in pairs.

OPERATING CONTROL

Default settings

The following are the default Bill-to-Bill settings:

The **switch setting** (on the validating head) is in “validation mode”; all denominations are enabled; the bill orientation is set to four-ways, and the interface communication speed is 19200 BPS.

Recycling cassettes are pre-programmed for the three lowest bill denominations (assuming there are no special requirements in a User’s order).

Internal clock is set to EST zone (GMT-5).

The **unload level** for the recycling cassettes is “0”.

The automatic **unload time** for the recycling cassettes are “indefinite”.

DIP Switch settings

The DIP switches are located at the rear of the validating head, under the transparent cover.

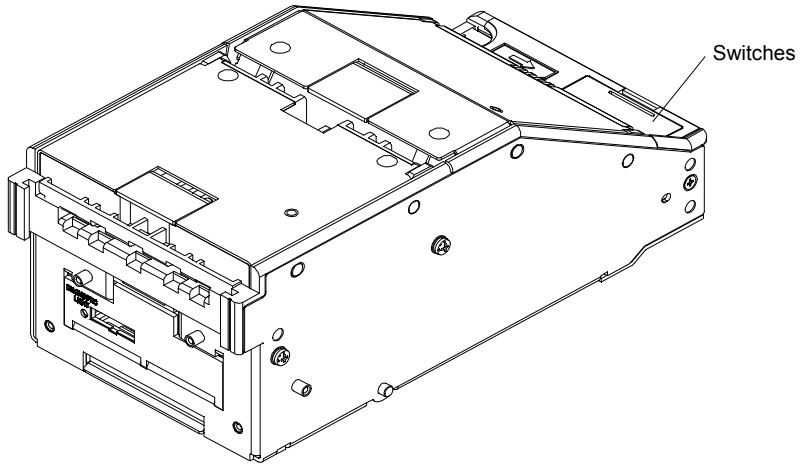


Fig. 46

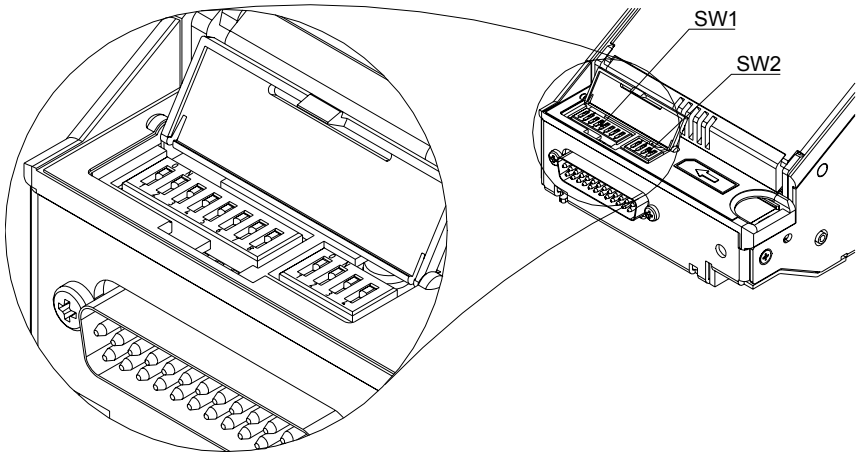
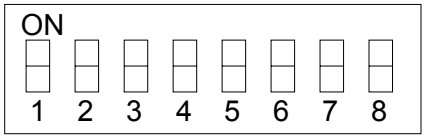


Fig. 47

The Bill-to-Bill operates in two basic modes: validation mode and service mode.

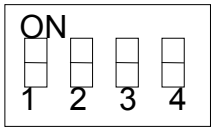
Validation mode: This is the mode for normal operation. If a red status light is illuminated, this indicates that the bill validator is not ready to accept currency.
Service mode: This is the mode for software update and testing the CashCode bill validator.

A series of 8-position DIP switches (SW1) define the settings and program the bill validator is to recognize, in order to validate a variety of bill denominations.



Switch	ON	OFF
SW1.1	Denomination #1 ENABLE	Denomination #1 DISABLE
SW1.2	Denomination #2 ENABLE	Denomination #2 DISABLE
SW1.3	Denomination #3 ENABLE	Denomination #3 DISABLE
SW1.4	Denomination #4 ENABLE	Denomination #4 DISABLE
SW1.5	Denomination #5 ENABLE	Denomination #5 DISABLE
SW1.6	Denomination #6 ENABLE	Denomination #6 DISABLE
SW1.7	Denomination #7 ENABLE	Denomination #7 DISABLE
SW1.8	Denomination #8 ENABLE	Denomination #8 DISABLE

The 4-position DIP switches (SW2) are defined below:



Parameter	Switch	ON	OFF
Orientation of the Bill	SW2.1	Four-way	One-way
	SW2.2	Reserved	Reserved
Interface Communication Speed	SW2.3	9600 BPs	19200 BPs
Mode	SW2.4	Service Mode	Validation Mode

For additional information on switch features and explanations, please see the software description for your particular Bill-to-Bill.

Regular Bill-to-Bill operation

Once power for the Bill-to-Bill is turned on, the Bill-to-Bill performs a self-test which takes 10 -15 seconds. During this test, the Bill-to-Bill checks all of its sensors, mechanisms and connections. During this test, some of its sensors are also adjusted accordingly. If the test concludes normally, and the Bill-to-Bill passes the test, then the Bill-to-Bill prepares itself for operation. Once the status light on the bezel illuminates green, the Bill-to-Bill is ready for operation.

The Bill-to-Bill must operate under the control of an external host controller. All commands from the host controller must be in the format of the CCNET interface protocol.

An inserted bill follows along the sensors in the validating head. The processor analyzes data from the sensors. The processor then determines the denomination and authenticity of the bill. A bill considered as not authentic is rejected. Should a bill be recognized as authentic, then data concerning the bill denomination will be communicated

to the host controller. The position of the bill at that moment is called “escrow”. The bill from this position can be returned to the User through the bezel, located at the validating head.

The **host controller** must then generate a command to instruct the Bill-to-Bill what to do with the bill next. There are three options:

- **return** the bill back to the customer
- **accept** the bill to the **drop cassette**, or
- **accept** the bill to one of the **recycling cassettes**.

The Bill-to-Bill will verify whether the recycling cassette is programmed to store the same denomination—and whether there is free space for the accepted bill. Should the Bill-to-Bill not be able to perform the command, an error code will then be sent to the host controller.

The **host controller** may issue a command to dispense bills to the User. In this case, the Bill-to-Bill will verify that the ordered amount of bills is available in the recycling cassettes—and that the total number of bills does not exceed 20. If the Bill-to-Bill is able to perform the order, it will then dispense the ordered amount of bills to the User through the dispensing cassette.

Possible Errors during operation

Should the Bill-to-Bill be unable to complete its current operation (either bill acceptance or a command from the host controller), it will stop, and send an error code to the host controller. The error code will also be indicated on the bezel of the Bill-to-Bill. Errors can occur if the Bill-to-Bill did not successfully pass its self-test. For a detailed description of errors, please refer to Appendix 1.

Application settings

The Bill-to-Bill has several internal **settings** that can be programmed.

The settings can be programmed:

- via interface by the host controller (main option)
- manually via service keypad at the dispensing cassette (service option)

The following **options** can be programmed and/or reprogrammed:

Designation of **bill denomination** for each of the recycling cassettes. This setting will be saved in the internal memory of the recycling cassette. Once programmed, the recycling cassette can be placed in any position in the Bill-to-Bill—and will operate with the designated denomination only.

The recycling cassette can be programmed for a **multi-escrow** application. This means that all validated bills will be directed from the validating head into the recycling cassette. This option is useful when more than one bill is inserted during one transaction. Should the User cancel the transaction, all of the same bills will be returned through the dispensing cassette. Should the transaction complete successfully, all bills from the multi-escrow recycling cassette will be reloaded into the drop cassette and/or the other recycling cassettes. This operation will be completed automatically, during the period of time before the next User starts a transaction. When the next User inserts a bill, the reload process will be temporarily paused, and the Bill-to-Bill will promptly serve the new User. The reload process will recommence between Users.

Unloading options. Bills from the recycling cassettes can be reloaded into the drop cassette. This mode can be initiated:

- Externally from the host controller
- Or from the service keypad

It can be initiated from the Bill-to-Bill itself at a designated **unload time**. In this instance, the time from internal clock will be used.

Unloading can be done until the recycling cassette is empty, or until the designated number of bills is left in the cassette ("**unload level**").

Setting up unloading options may be different for each of the recycling cassettes.

Upper load limit of bills in recycling cassettes. The Bill-to-Bill will try to replenish all of its recycling cassettes with validated bills. All validated bills will be directed to a recycling cassette with its corresponding denomination. Extra bills will be directed to the drop cassette. The upper load limit for each recycling cassette can be designated and programmed.

SERVICE KEYPAD

The **service keypad** is located on the front panel of the dispensing cassette. The service keypad must be covered by the front door of the cabinet (cabinet not included with the Bill-to-Bill), and an opening in the door must allow access to the dispensing outlet only. The service keypad has four buttons, which are designated as follows:

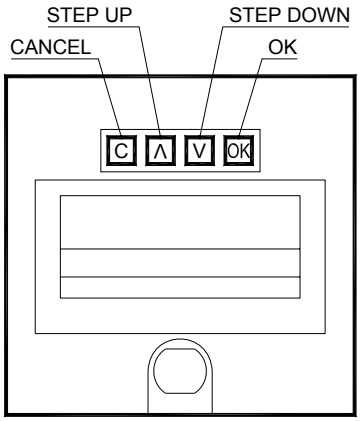


Fig. 48

All commands from the service keypad can be entered only when the validating head is in **service mode**. To activate service mode, please refer to the Switch Settings section.

Caution! Do not forget to reset the switch settings to "validation mode" once operations with the service keypad are completed!

SETTING BILL DENOMINATIONS FOR RECYCLING CASSETTES

Reassigning bill denominations to recycling cassettes in the Bill-to-Bill is possible once the Bill-to-Bill has finished a transaction—and has an illuminated green status light in the bezel. If the recycling cassette is not empty at the time of bill denomination reassignments, then all bills will be unloaded from the specific recycling cassette to the drop cassette—before the cassette can be reprogrammed.

The compartments for the recycling cassettes are numbered accordingly, as seen in Fig. 49.

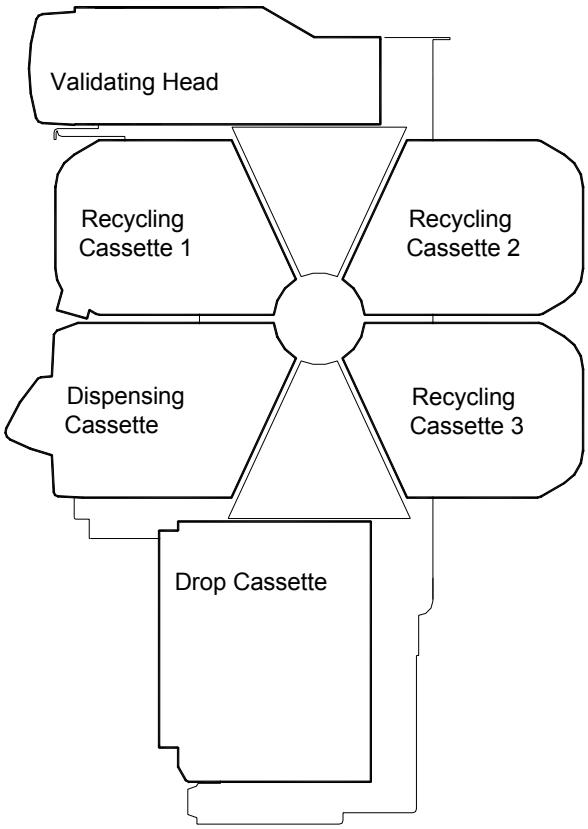


Fig. 49

From the host controller:

Please see the CCNET protocol description, entitled: “CashCode NET Interface Manual”.

From Service keypad:

Description	Sequence of button operation	Message on digital display
1. Software update cassette #1 for denomination 03 (e.g. $5 US)		
Go to cassette setting menu	OK V	>SETUP TYPE CST<
Choose cassette number 1	OK V V V	>SET TYPE – CST1<
Choose denomination $5	OK V V	>03 – US, 5<
Save denomination	OK	OPERATION UNLOAD Operation –OK!
		>SET TYPE – CST1<
Return	C C	

Description	Sequence of button operation	Message on digital display
2. Software update cassette #3 for multi-escrow		
Go to cassette setting menu	OK V	>SETUP TYPE CST<
Choose cassette number 3	OK V V V V V	>SET TYPE – CST3<
Choose multi-escrow	OK V V V V V V	>08-ESCROW<
Save denomination	OK	OPERATION UNLOAD Operation –OK!
		>08-ESCROW<
Return	C C	

UNLOADING OPTIONS

From the host controller:

Please see the CCNET protocol description entitled: “CashCode NET Interface Manual”.

From service keypad:

Description	Sequence of button operation	Message on digital display
1. Direct complete unload		
Choose unload bills	OK	>Unload Bills<
Choose unload all	OK	>Unload Level<
Choose all cassettes	OK	>All Cassettes<
Unload all cassettes	OK	OPERATION UNLOAD Operation-OK!
		>All Cassettes<
Return	C C C	
2. Direct unload cassette #2 to level		
Choose unload bills	OK	>Unload Bills<
Choose unload level	OK V	>Unload Level<

Description	Sequence of button operation	Message on digital display
Choose cassette #2	OK V V	>Cassette N2<
Unload cassette #2 to designated level	OK	OPERATION UNLOAD Operation-OK!
		>Cassette N2<
Return	C C C	
3. Set unload level cassette #3		
Choose Unload Bills	OK	>Unload Bills<
Choose set/view level	OK V V	>Set/View Level<
Choose set level cassette #3	OK V V	>Set Level cst3<
View unload level	OK	Current Level 15
Correcting level	Λ Λ Λ	Current Level 18
Save setting	OK	>Set Level cst3<
Return	C C C C	

SETTING INTERNAL CLOCK

From the host controller:

Please see the CCNET protocol description entitled: “CashCode NET Interface Manual”.

From service keypad:

Description	Sequence of button operation	Message on digital display
1. Set current time and date		
Choose time and date	OK V V V	>Time and Date<
Choose setting time	OK	* > 10:17:34 < * 02/21/03-FRI
Choose setting hour	OK	* > 10:17:34 < * ^^10
Setting hour	OK V	10:17:34 ^^09

Description	Sequence of button operation	Message on digital display
Save setting	OK	* > 09:17:34 < * ^^09
Choose setting minutes	V	* > 09:17:34 < * ^^17
Setting minutes	OK Λ Λ	09:17:34 ^^19
Save setting	OK	* > 09:19:34 < * ^^19
Choose setting date	C V	* > 09:19:34 < * 02/21/03-FRI
Choose setting month	OK	* > 02/21/03-FRI < * ^^02
Setting month	OK V	02/21/03-FRI ^^03
Save setting	OK	* > 03/21/03-FRI < * ^^03
Choose setting day of month	V	* > 03/21/03-FRI < * ^^21
Setting day of month	OK Λ Λ	03/21/03-FRI ^^23
Save setting	OK	* > 03/23/03-FRI < * ^^23
Return	C C C	

Inquiries about the Bill-to-bill settings and status

Inquiries from the service keypad:

Description	Sequence of button operation	Message on digital display
1. Type of bill in cassette #3		
Go to cassette setting menu	OK V	>Setup type cst<
Choose cassette #3	OK V V	>View type cst3<
Inquiry (cassette #, currency, denomination)	OK	01 – USA, 1
Return	C C	
2. Number of bills in cassette #2		

Description	Sequence of button operation	Message on digital display
Go to cassette setting menu	OK V V	>Cst viewing<
Choose cassette #2	OK V	>View type cst2<
Inquiry about number of bills	OK	056
Return	C C	
3. Current time and date		
Choose time and date	OK V V V	>Time and date<
Inquiry about time and date	OK	* > 10:17:34 < * 02/21/03-FRI
Return	C C	

Inquiries about software VERSION and PART NUMBER

From the service keypad:

Description	Sequence of button operation	Message on digital display
1. Software version of cassette #1		
Go to view versions menu	OK V V V V	>View versions<
Choose software version of cassette #1	OK	>Version CAS1<
Inquiry software version	OK	000-41 DL 0800
Return	C C	
2. Software version of cassette #2		
Go to view versions menu	OK V V V V	>View versions<
Choose version of cassette #2	OK V	>Version CAS2<
Inquiry software version	OK	000-41 DL 0800

Description	Sequence of button operation	Message on digital display
Return	C C	
3. Software version of cassette #3		
Go to view versions menu	OK V V V V	>View versions<
Choose software version of cassette #3	OK V V	>Version CAS3<
Inquiry software version	OK	000-41 DL 0800
Return	C C	
4. Software version of dispenser		
Go to view versions menu	OK V V V V	>View versions<
Choose software version of dispenser	OK V V V	>Version DISP<
Inquiry software version	OK	000-41 DL1000
Return	C C	
5. Software version of central processor		
Go to view versions menu	OK V V V V	>View versions<
Choose software version of central processor	OK V V V V	>Version CP<
Inquiry software version	OK	000-49 DL 1100
Return	C C	
6. Software version of validating head		
Go to view versions menu	OK V V V V	>View versions<
Choose software version of validator head processor	OK V V V V	>Version VH<

Description	Sequence of button operation	Message on digital display
	V	
Inquiry software version	OK	DL 0319 B150
Return	C C	
7. Part number		
Go to view versions menu	OK V V V V	>View versions<
Choose part number	OK V V V V V V	>Part Number<
Inquiry part number	OK	BB - US 1156
Return	C C	

Software updates

The Bill-to-Bill Software consists of Validating Head software and Chassis software. Chassis software includes central processor software, cassette software and dispenser software.

Validating Head software updates:

The Bill-to-Bill Currency Management System is supplied with pre-installed software, according to a User's order. A "dummy card" is normally placed in the slot indicating the software version. Software updates are recommended whenever new currency is issued, or whenever counterfeit bills appear on the market.

Software updates are offered in three options:

1) New software can be ordered with a single-download memory card. The software from the new memory card is downloaded as soon as it is inserted into the slot, and the validating head is powered on. The memory card must be present at all times for the Bill-to-Bill to operate.

2) New software can be ordered with a multi-download memory card. The software supplied through the multi-download memory card allows the Bill-to-Bill to operate even after it is removed from the slot. The memory card can be used for updating the next Bill-to-Bill unit, depending on the number of licenses ordered. Typically a multi-download memory card is issued for a specified number of downloads, and therefore the number of downloads required must be defined in the User's order.

3) A special memory card can be ordered, which allows the download of new software through the interface connector. This memory card must be present in the validating head at all times. The download can be done via the host controller (and local network). Downloads can also be accomplished with any personal computer. The Bill-to-Bill must be temporarily disconnected from the host controller for this purpose.

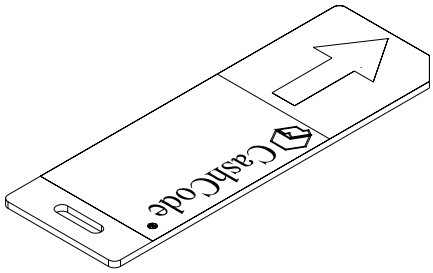


Fig. 50

VALIDATING HEAD SOFTWARE UPDATE PROCEDURES

Download Procedure for a Single-download Memory Card:

Step 1. Turn Power OFF.

Step 2. Lift up the latch under the validating head; and remove the validating head from the housing.

Step 3. Remove the card from the slot.

Step 4. Insert the new memory card.

Step 5. Insert the validating head into the housing.

Step 6. Turn power ON and wait until the download process is completed. During the download, the status indicator will flash RED-GREEN. Or the Digital Display will display a software updating message. Once the download is completed, the unit will initialize and the status light will turn green. If there were no communication with the controller the light would stay RED.

Download Procedure for the Multi-download Memory Card:

Please follow the instructions for the single-download memory card. Follow steps 1 through 6. After the successful completion of step 6, remove the card from the slot. (Follow steps 1,2,3 and 5).

Turn power ON. The Bill-to-Bill will initialize and the status light will turn GREEN. If there is no communication with the controller the light would stay RED.

The memory card can be used to download other Bill-to-Bill units, until the number of preordered downloads is reached.

Download Procedure via Interface Connector:

In order to properly complete an interface download, a network download memory card must be present in the slot at all times—before and during the download.

1.The software download can be accomplished via the host controller (please refer to CCNET protocol description).
2.For a direct download via the interface connector, please follow the instructions below:

Step 1. Turn power OFF.

Step 2. Disconnect the interface connector from the Bill-to-Bill.

Step 3. Connect the personal computer to the Bill-to-Bill.

Step 4. Perform update.

Step 5. Disconnect the computer.

Step 6. Connect the interface connector to the Bill-to-Bill.

Step 7. Turn power ON.

Chassis software updates:

New software can be ordered with a memory card. The software supplied through the memory card allows the Bill-to-Bill to operate after it is removed from the slot. The memory card can be used for updating others Bill-to-Bill units.

Download Procedure for Memory Card

Please follow the instructions for the memory card. Follow steps 1 through 6. After the successful completion of step 6, remove the card from the slot. (Follow steps 1, 2, 3 and 5).

Turn power ON. The Bill-to-Bill will initialize and the status light will turn GREEN. If there is no communication with the controller the light would stay RED.

Download Procedure via Interface Connector:

In order to properly complete an interface download, a network download memory card must be present in the slot at all times—before and during the download.
1.The software download can be accomplished via the host controller (please refer to CCNET protocol description).
2.For a direct download via the interface connector, please follow the instructions below:

Step 1. Turn power OFF.

Step 2. Disconnect the interface connector from the Bill-to-Bill.

Step 3. Connect the personal computer to the Bill-to-Bill.

Step 4. Perform update.

Step 5. Disconnect the computer.

Step 6. Connect the interface connector to the Bill-to-Bill.

Step 7. Turn power ON.

Software Update Diagnostics

Normally, the download process will be accompanied by a blinking red-green status light lasting approximately one minute. If the download has competed successfully, the status light will turn green. Should the download be unsuccessful, the status light will indicate short green flashes followed by a long red.

The following table lists errors related to software update procedure.

Status of diagnostic light	Error description	Fault-Handling
1 green flash on red	External interface error in CCNET download mode	1. Verify that software is suitable for CCNET download. 2. Repeat procedure.
2 green flashes on red	Memory card CRC error	1. Turn power OFF, remove and reinsert the memory card, turn power ON. 2. Replace memory card with a new one.
3 green flashes on red	Incorrect data in memory card	1. Verify that the software is suitable to the B2B type. 2. Insert correct type of CashCode memory card.
4 green flashes on red	Memory card is not inserted	Properly insert the memory card.
5 green flashes on red	Wrong type of memory card	Insert the correct type of CashCode memory card.
6 green flashes on red	Failure during download	1. Turn power OFF, remove and reinsert the memory card, turn power ON. 2. Replace memory card with a new one.
7 green flashes on red	Operation error of memory card interface	1. Turn power OFF, remove and reinsert the memory card, turn power ON. 2. Replace memory card with a new one.

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